LOUISIANA CONSERVATION REVIEW

PARTMENT OF CONSERVATION, STATE OF LOUISIANA. AUTUMN, 1940

The MAGNET

Impelling--Insistent--Inevitable

Certain cycles or intervals in the development of our country have witnessed an accelerated flow of capital and enterprise, marked by an apparent trend of population, towards some particular section, as if unseen forces had conspired to draw them with the mysterious attraction of the magnet.

Here in Louisiana there was such a period preceding the War between the States; when river transportation was in its heyday and New Orleans was the fastest growing city of America—but for forty years after the War the clock of progress seemed to stop, the inflow of new capital and new blood was shunted westward, first to the Middle West, thence to the Far West.

Now we can feel certain unseen forces at work again, with a magnetic attraction that is impelling, insistent, inevitable.

The eyes of industry, north and east, are again turning southward, away from the congested areas where the initial cost of manufacturing establishments is followed by high costs of plant operation, of labor and taxes.

Since last April over $50,000,000 in new industries have located in Louisiana. Louisiana's industrial output and raw products are in demand for defense preparations. They are here in abundance. The state annually produces 100,000,000 barrels of crude oil, 350,000,000,000 cubic feet of gas, 1,000,000 tons of salt, 400,000 tons of sulphur, more than 1,000,000,000 feet of lumber.

Assignment already of over 120,000 troops in the state under the nation's defense program and the influx of new industries will make the land of Evangeline and Lafitte eminently equal to the task of protecting the mighty Mississippi river and its broad fertile valley from invasion in case of war.

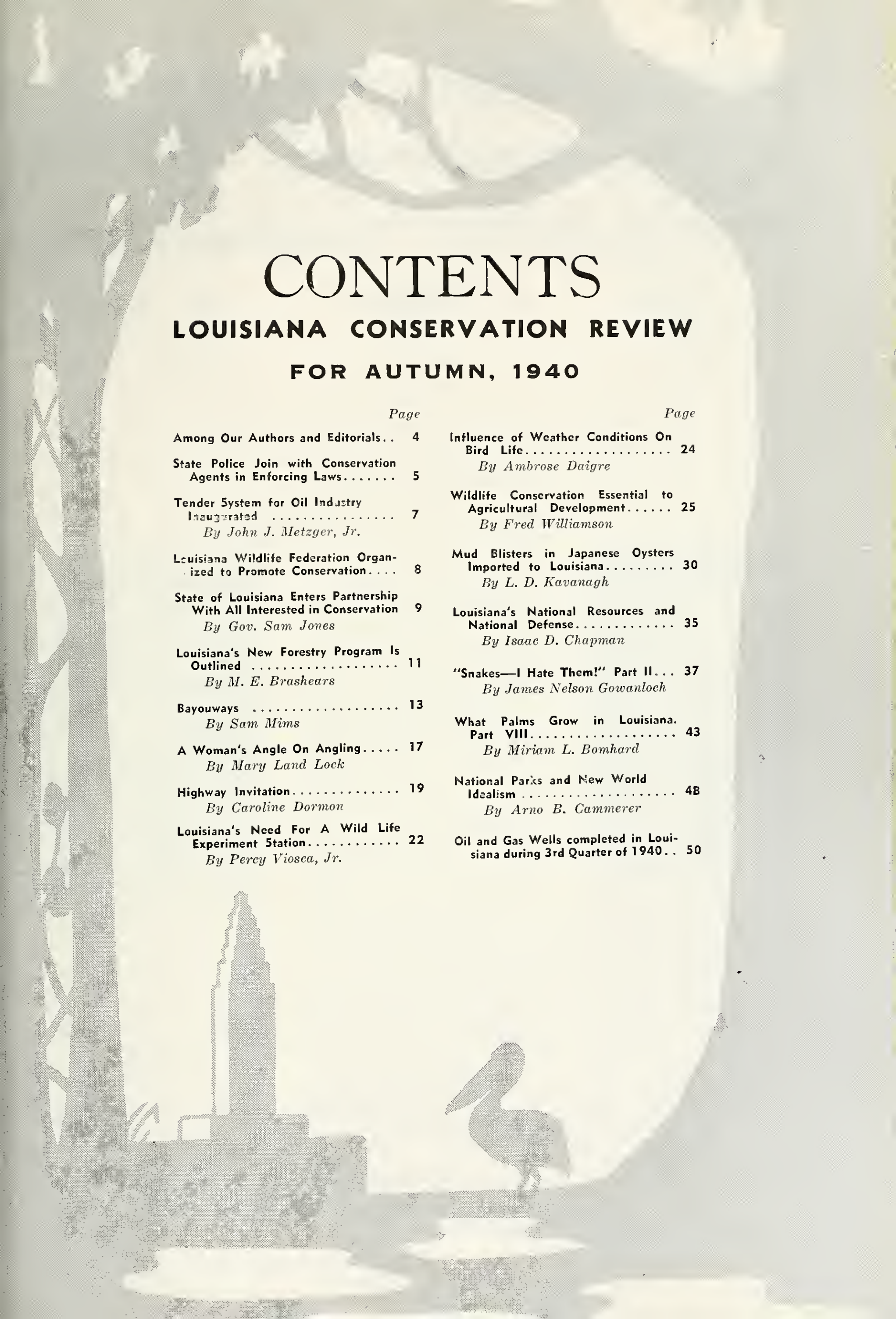
Investors, industrialists, men of vision and enterprise everywhere will want to get in on the "ground floor" of this new development in Louisiana.

The magnet is pulling—why resist it?

Department of Conservation

126 CIVIL COURTS BLDG.

New Orleans, La.



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AMONG OUR AUTHORS

Sam S. Mims, the author of "Bayouways" in this issue, is a well known Louisianian and a writer of note. His latest book, "Oil is Where You Find It", a story about the human side of the oil business, has recently been published. At present Mr. Mims is connected with the Louisiana State Planning Commission as Planning Technician.

* * * *

Mary Land Lock, who contributes an article of interest to all women and men too, on fishing, has won many laurels for her angling ability. She is a member of the staff of the publicity and education division of the Department of Conservation. She has recently published a book of poems entitled, "Shadows of the Swamp".

* * * *

Fred Williamson, who writes of wildlife conservation as essential to agricultural development, has recently completed a history of agricultural progress in Louisiana, entitled "Yesterday and Today in Louisiana Agriculture". He is an experienced newspaperman, former editor of the Monroe News-Star and at present is associated with the editorial department of the Agricultural Extension Service at L. S. U.

* * * *

"Highway Invitation" is the title of a most interesting article contributed by Caroline Dormon, who has the distinction of being one of the few members of her sex to be an associate member of the Society of American Foresters. She is the author of Louisiana Wild Flowers, Forest Trees of Louisiana, and numerous magazine articles.

EDITORIALS

THE "GO" SIGNAL

A new and unprecedented era of progress in wildlife conservation in Louisiana has been made possible by the approval of the Reorganization Amendment by the voters of the state at the general election held November 5th.

Drastically affected by the Reorganization Amendment is one of Louisiana's most important Departments, the Department of Conservation. Wildlife conservation will now be given the recognition and respect so long neglected in this state.

In the reorganization of Louisiana's state government, fish, game and other wildlife activity will be completely divorced from oil, gas and other minerals and when the new set-up is completed the Department of Conservation will concern itself entirely with the conservation of wildlife and matters directly related thereto. Oil, gas and other minerals will come under a separate and new Department of Minerals.

The "go" signal has been given. The "green light" is showing and a new day is ahead for wildlife conservation in Louisiana.

Other contributors include M. E. Brashears, new State Forester, James Nelson Gowanloch, State Biologist; John J. Metzger, Jr., chief engineer of the Minerals Division; Percy Viosca, Jr., Consulting Biologist; Ambrose Daigre, taxidermist for the Conservation Museum; Miriam L. Bomhard, Associate Forest Ecologist of the U. S. Department of Agriculture, L. D. Kavanagh, Biologist Division of Oysters and Water Bottoms.

WILDLIFE CONSERVATION

All followers of wildlife conservation will be vitally interested in the article appearing in this issue by Governor Sam Houston Jones reproduced from an address the governor recently delivered at the organization meeting of the Louisiana Wildlife Federation.

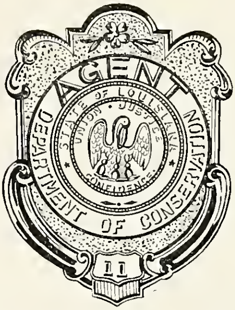
It gives further evidence to the fact that the State of Louisiana is going to give the subject of wildlife conservation the attention that it so richly deserves.

Louisiana has the natural resources and the advantages to make this state a paradise for hunting and fishing. We need only to grasp the opportunities that are before us. Federal statistics show that Louisiana winters a large percentage of the entire continent's supply of some types of game birds and migratory fowl. But that doesn't begin to tell the story of Louisiana's natural advantages as a wildlife paradise.

The governor urges a partnership between the State of Louisiana and those interested in wildlife conservation. Everyone can assist in the success of this program by preaching and practicing the doctrines of conservation. In return for this cooperation, the governor pledges that the State will administer the technical conservation job for the benefit of the game and for no one's political profit.

For a better understanding of Louisiana's new wildlife conservation program, we recommend the reading of Governor Jones' article on page nine in this issue.

State Police Join With Conservation Agents In Enforcing Game Laws



The strength of the mighty Louisiana State Police organization has joined forces with the small army of Louisiana Conservation agents to enforce the conservation laws of the State and henceforth Louisiana is going to be a very tough state for those who make it a practice to violate hunting and fishing laws.

Brigadier-General Steve Alford, Superintendent of the State Police.

Commissions have been issued by the Department of Conservation to the members of the State Police force and these officials now have the authority, which they did not have in the past, to make arrests for violations of conservation laws.

The working arrangement between the State Police and the enforcement division of the Department of Conservation was completed recently at a conference attended by Brigadier-General Steve Alford, Superintendent of State Police and Don L. Simon, chief enforcement officer of the Department of Conservation.

Conservation Commissioner B. A. Hardey, his Executive Assistant J. A. Partridge and Chief Enforcement Officer Simon joined together in praising the cooperation extended by State Police Superintendent Alford. The plan is in line with the efforts being exerted by Superintendent Alford to coordinate the forces of law enforcement in Louisiana, and is expected to prove a great boon to the efficiency of conservation law enforcement in the state.

In describing the effectiveness of the reorganized law enforcement division of the Department of Conservation, facts and figures speak more eloquently than words. The statistics tell the story.

From June through October, 1938, records show a total of 254 arrests. The convictions for the entire year of 1938 were 28. From June through October, 1939, arrests totaled 139 and convictions for the entire year amounted to one.

From June through November 12 of this year, there have been 518 arrests, 82 convictions, 18 acquittals and 418 cases pending.

AFTER MARKET HUNTERS

Under the general plan worked out, State Police now have the authority to assume the duties of Conservation Agents when occasion demands and enforcement agents of the Conservation Department out in the field will cooperate with State Police on matters other than game violations whenever necessary. Highway patrolmen have been asked to keep a special lookout for market hunters, those who transport illegal game and fish.

One of the first divisions to undergo reorganization in the Department of Conservation was the Enforcement Division. Don L. Simon of Crowley was placed in charge as chief enforcement officer and director of the division. He lost no time in getting to work. New methods were immediately inaugurated to replace antiquated policies, and the result has brough about better teamwork, precision and harmony.

Assisting Simon in directing the work of the Enforcement Division is Howard L. de la Houssaye of New Orleans, who has recently been named assistant director of the division.

Don L. Simon, Director Enforcement Division, Department of Conservation.

SIX DISTRICTS IN STATE

The state has been divided into six districts with a supervisor in charge of conservation agents in the parishes in his particular district. In addition there are six state rangers who work directly under the supervision of state headquarters in New Orleans and work all over the state.

The six state districts, the supervisor in charge, and the parishes in each of these districts are as follows:

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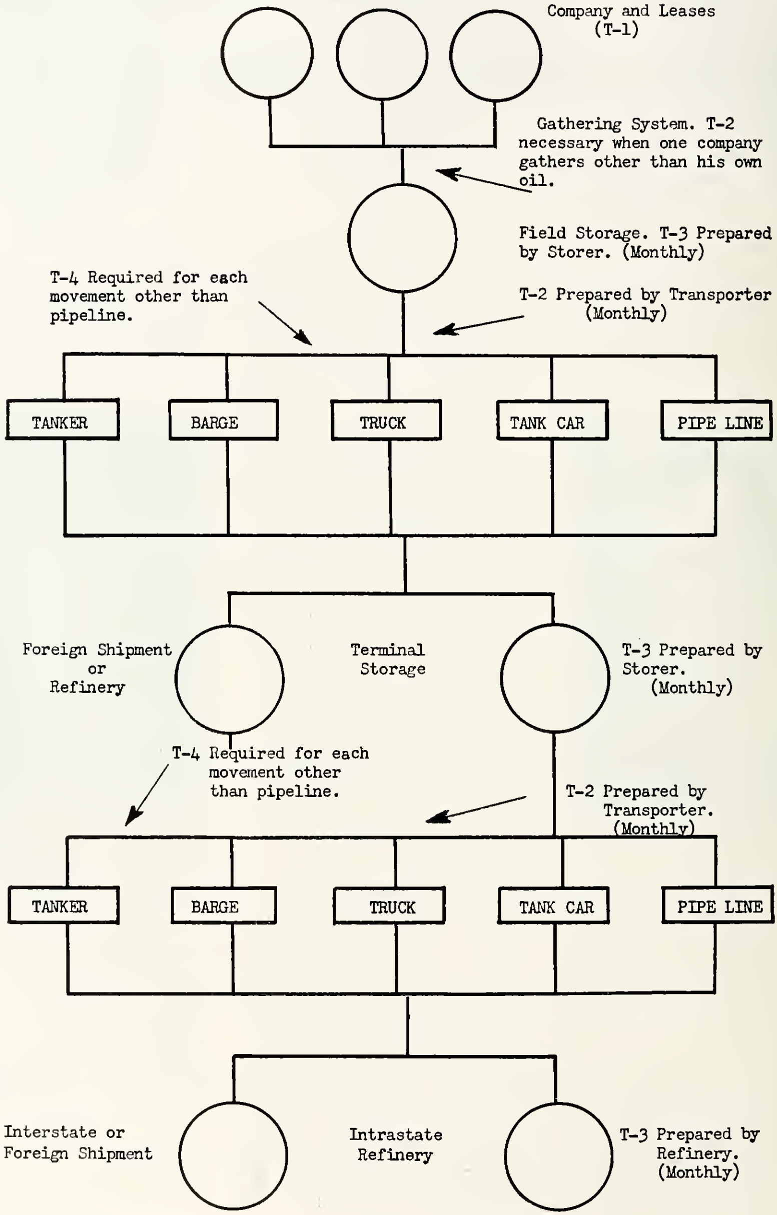
DIAGRAM OF LOUISIANA'S TENDER SYSTEM


Company and Leases (T-1)
Gathering System. T-2 necessary when one company gathers other than his own oil.
Field Storage. T-3 Prepared by Storer. (Monthly)
T-4 Required for each movement other than pipeline.
T-2 Prepared by Transporter (Monthly)
TANKER
BARGE
TRUCK
TANK CAR
PIPE LINE
Foreign Shipment or Refinery
Terminal Storage
T-3 Prepared by Storer. (Monthly)
T-4 Required for each movement other than pipeline.
T-2 Prepared by Transporter. (Monthly)
TANKER
BARGE
TRUCK
TANK CAR
PIPE LINE
Interstate or Foreign Shipment
Intrastate Refinery
T-3 Prepared by Refinery. (Monthly)

Tender System For Oil Industry Inaugurated

by
John J. Metzger, Jr.*

The State of Louisiana, through the Department of Conservation, has for some time been engaged in a thoroughgoing study of the gathering, transporting, storing and refining of petroleum, and as the result of this survey has recently inaugurated the oil "tender" system which has for some years been in operation in such other large oil producing States as Texas, Oklahoma and Arkansas.

Under the previous system of monthly reports which were filed with the Department of Conservation, the actual movements of the oil from the fields to storage terminals or to refineries were not clearly reflected. These movements are important for several reasons. These reports are checked to determine their authenticity and the legality of the production. The need for an accurate and clear picture as to what is happening in the different phases of the oil industry in the State should be readily appreciated at the present time. The market demand for crude has steadily become weaker and weaker and the oil producing States have been constantly bombarded with the phrase "To much oil is going to storage," and very little has been known as to the gravity, the origin or the price being paid for the oil that is stored. So, with these facts in mind, the Department of Conservation has devised its present tender system.

The Louisiana system of tenders consists of four separate forms, namely: Form "T-1", Form "T-2", Form "T-3" and Form "T-4".

Form T-1 shows the producer's tenderable stocks of oil by leases, as well as the allowable production for the current month; to whom the oil is tendered and the gatherer or transporter.

Form T-2 is a record of the acquisitions and dispositions of the transporter, and is required for each movement of oil, whether it is gathered off leases, transported to or from sub-stations to central terminals, to refineries or foreign shipments.

Form T-3 is a record of the acquisitions and dispositions of the storer or refiner and this form is required whenever oil is stored or stops en route, either at a sub-station, a central terminal or at a refinery.

Form T-4 is a manifest of individual shipments of crude oil by barge, truck, tanker or tank-car.

At best, a tender system can only indicate that something is wrong. It is definitely not a cure-all for stopping "hot oil" or other sharp practices inimical to the industry. It can be made to be a burden, both to the industry and to the State, or it can be a first-aid to both.

Editor's Note—An innovation in Louisiana's oil production has recently been inaugurated by the Minerals Division of the Department of Conservation. It is called the "tender" system and its principal purpose is to give a clearer reflection of the actual movements of the oil from the fields to storage terminals or refineries, thereby eliminating possibility of any "hot" oil being moved within the state.

A diagram of the new system is shown on the opposite page. It shows the forms and reports that are now required from the time the oil leaves the well until it gets to the refinery or is shipped out of the state.

While the "tender" system is new in Louisiana, it has been in operation for several years in other large producing states such as Texas, Oklahoma and Arkansas.

Many times a state may be charged with running to storage more oil or granting higher allowables when, if the truth is known, the oil may be coming into the State from outside, at distressed market prices. The storers, refiners and purchasers, desiring to take advantage of these conditions and stock up on this low-priced crude, could readily spread such propaganda with the hope that the State's regulatory bodies would restrict the allowables. This would allow them to purchase the low-priced crude and not carry excessive stocks.

On the other hand, if the State is storing more oil than can readily be absorbed by the market, the tender system will reflect what particular crude is being stored and steps may be taken to adjust the allowables in that area, or to provide another outlet for the crude.

Many times, if the facts are known, the solution to the problem is easily found in the early stages, and the longer they are kept in the dark, the harder they are to remedy, as was the case in August of 1939, when a "shut-down" was necessary to adjust and reduce the ever-growing stocks of crude and gasoline.

The present tender system may not be found perfect, and perhaps it will have to be revised from time to time. It is our sincere wish that the oil industry of this State will see the necessity for such a system and will cooperate.

---

[*] Chief Engineer, Minerals Division.

STATE OIL SURVEY ASKED

A survey of petroleum reserves in the high gravity fields by the technical staffs of oil companies operating in Louisiana was asked by Conservation Commissioner B. A. Hardey in an open hearing held November 15th.

Object of the survey will be to obtain some of the refineries for aviation gasoline, as specified in the national defense program outlined at the American Petroleum institute meeting in Chicago early in November.

Approximately 2,500,000 gallons of 100 octane gasoline daily are needed under the program, and the Reconstruction Finance corporation has agreed to finance building of plants near the fields, so that transportation will not become a problem.

Instead of one big refinery in a central location, several smaller plants will be built in or near the oil fields.

No date was set for the reports of the engineers.

Louisiana Wildlife Federation Organized To Promote Conservation

Organization of the Louisiana Wildlife Federation was completed at a state-wide meeting of sportsmen from all parts of Louisiana at the Jung Hotel in New Orleans, Sunday, October 27th.

Temporary officers elected were Fred J. McCormac of New Orleans, president, H. E. Cabaud, Jr., vice-president, and Paul McIlheny, secretary-treasurer.

The convention approved a charter for the Louisiana Wildlife Federation, Inc., and it has been filed with the Secretary of State.

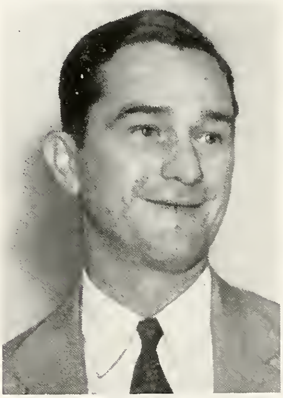
Elected to the board of directors were James O. Grout, Angus Eason, Roger T. Stone, Bob Leanhard, Henry Chaffe, George Westfeldt and Ulisse Nolan, all of New Orleans; Brenier Thibaut, Napoleonville; Spencer B. Lake, Donaldsonville; Dudley Berwick, Eunice; Leroy Dunn, Covington; Vincent Mosley, Opelousas; Rodney L. Hubert, Plaquemine; A. L. Irwin, Clinton; Laigh C. Parker, Monroe; Cenas Gaines, Lake Charles; John Campbell and J. J. Besson, Baton Rouge; W. J. Cleveland, Crowley; G. C. Vidrine, Oakdale; Hardy Durand, Lafayette; Dr. W. A. K. Seale, Sulphur and Kenneth McLaughlin, Amite.

Several directors for sections of the state not represented at the convention may be elected later, Mr. McCormac said.

Albert M. Day, Washington, D. C., Chief of Federal Aid in Wildlife Restoration.

Governor Sam Jones was the principal speaker at the concluding session of the convention Sunday night and he pointed out that the divorcement of the wildlife division of the Louisiana conservation commission from the minerals division is an aim of his administration. The governor also cited steps his administration has taken to render Louisiana the favorite state of the sportsman-tourist.

J. A. Partridge, Executive Assistant to the Louisiana conservation commissioner, also a speaker at the night session, said that increased arrests and the reorganization of the publicity and education divisions of the commission were major steps taken by the new administration. "Enlargement of quail and fish hatcheries is under way, and the state is now qualified for the first time under the Pittman-Robertson act to secure federal money for wild-life purposes. It is hoped that turkey and deer projects can begin soon", Mr. Partridge said.



Fred J. McCormac, New Orleans, elected first president of the Federation.

William H. Tucker, conservation commissioner of Texas declared that parts of the State of Texas now have more deer than in the time of its original Indian inhabitants through a sensible program of conservation and propogation.

J. A. Partridge, Executive Assistant to the Conservation Commissioner.

"The worse problem facing the conservation commissioner is the lack of public interest and absence of understanding. You have taken the first step toward correcting that today", he told the federation. "The non-hunter and non-fisher must be made to realize that he has as great a stake in wild life as any other man."

The importance of Louisiana as a winter haven for migratory waterfowl was demonstrated by Albert M. Day, Washington, chief of the federal aid in wildlife restoration. "It is a key state in the whole program", Mr. Day said.

Ducks and geese in the United States have increased from an estimated 27,000,000 in 1934 to about 65,000,000 in 1940, Mr. Day said. The present estimate is still 40,000,000 below that for 1900, he pointed out.

Excerpts of the address of Executive Assistant J. A. Partridge to the convention follows:

"I bring greetings from the Department of Conservation to the Louisiana Wildlife Federation, to you fishermen and hunters and to all who are assembled here in the interests of wildlife, its restoration and its proper protection It is my belief that this is one of the most

[Turn to Page 28]

State of Louisiana Enters Partnership With All Interested In Conservation

by
Sam H. Jones
Governor of Louisiana

A good story has been going the rounds lately, based on the attempts to make France, Spain and other countries join Rome and Berlin in their war on the democracies of the world. Two New York business men were discussing the situation the other day.

"Hitler claims he's got all the others licked, so what's he want those others to come in for?" the first man asked.

"All I know," replied the second, "is that when business is good, you don't look for partners to take in."

Like many another true word spoken in jest, this applies to a great deal more than one single situation. It applies particularly to all who are interested in wildlife in Louisiana. It applies to the trapper, it applies to the sportsman, it applies to the commercial fisherman, it applies to those who fish for pleasure rather than for profit, it applies to the hunters of deer, duck, quail, geese, doves and snipe, as well as to those who hunt rabbits for the market, it applies to the state, it applies to the individual.

Business is bad for all of us who are interested in wildlife. The thing to do when business is bad is to take in partners. That's exactly what you did when you formed this federation. The trapper took in the sportsman and the fisherman and the hunter as partners, the public took in the state, the state took in the federal administration, and we've all pooled our chips. When business was good, when there was more than enough game to go around, and when inaccessible refuges produced enough game to make up for the loss in accessible regions, we could afford to go it alone. But when business is as bad as it is today in the wildlife industry of Louisiana, then we need each other's help. We need partners.

And, my friends, I am here to tell you in all earnestness that the most willing and enthusiastic partner you have today is the State of Louisiana under the administration I have the honor to head. This is no bid for votes or for popular support. All the things that votes can give you have already bestowed on us, and at this time I once more earnestly pledge you the co-operation of Louisiana in your efforts, not because of anything that I or my associates stand to gain from your good will, but because it is eternally and everlastingly RIGHT.

Let's take stock of the situation as it now confronts us, not in the technical language of the laboratory experts, but in the plain, homely one-syllable words of the every-day citizen of the United States of America; the chap who had a shot-gun or a .22 and a cane pole when he was a boy, and who grew up knowing how to use them, and loving the free, open country.

This article is reproduced from an address delivered by Governor Sam Jones at the organization convention of the Louisiana Wildlife Federation held Sunday, October 27, at the Jung Hotel in New Orleans. Governor Jones was one of the featured speakers at the concluding session of the one day convention.

PASSENGER PIGEONS GONE

None of us remember the clouds of passenger pigeons who once darkened the sky. But we do know what happened. We know that passenger pigeons sold for a nickel apiece in the Chicago market, that hunters would load up gas-pipe cannon with slugs and nails and even gravel and fire them up into the passing clouds of birds, and ship the results to the market in barrels. For some years business was good. Then, little by little, it fell off until it was only fair, until it was tough, and until the time finally came when it was not only bad, but very bad.

If the people of that day had taken in one another and their authorities as partners, if they had formed the kind of partnership you of Louisiana are forming today, passenger pigeons would still be plentiful. As it is, you know better than I do that for years the last passenger pigeon in the world was at the Cincinnati Zoo, and that a standing reward of $25,000 for a mate to it went unclaimed. I want you to go over that again for just a moment: Twenty-five thousand dollars could not buy one single bird which, only a few years earlier, had sold at a nickel apiece by the barrel! That threw a lot of people out of work. But those who had made a living out of supplying the market with passenger pigeons might have gone right on making a living to this very day, if they'd only formed the right partnership in time to do any good.

PARTNERSHIP NEEDED

That's exactly what we're up against in Louisiana, except that we still have time to form the partnership. I'm not going to talk about the law of diminishing returns and percentage surpluses or anything like that. I'm talking about the fact that we're not only barring OURSELVES from a share of the pursuit of happiness, we're not only shutting our children and their children off from the pleasures whose enjoyment has kept us a free and independent people. I'm talking about the fact that we're taking a lot of good round dollars out of our pockets and pitching them into the bottom of the sea. No, let me take that back. That's what we **were** doing before this partnership of ours was formed today, because now that we're all going to work together for the same end, we're not only going to keep those dollars, but add a lot of others to them.

Look at it this way: Some sections of this country can never restore abundant wildlife. In the densely settled centers of population of the North and East, for example, where city limits merge into each other, where you merely cross a paved street to get from one town to the next, where every stream is lined with big and little factories, fish and game could not live and thrive any more even if nobody pulled another trigger or wet another fishing line.

Whenever any one who lives in one of those regions wants to do a bit of hunting or fishing or engage in any of the many similar types of outdoor sport and recreation, he must go somewhere else to do it. That means, incidentally, that he must spend money, too. Where he spends it depends on where he goes. If we make conditions right in Louisiana, if we fix things so that the world knows that money spent here in recreation will give you a dollar and a half's worth of fun for every dollar spent, right here to Louisiana is where that man will come to spend his money. He will charter boats here, he will buy provisions here, he will stock up on what he lacks in the way of tackle, lures and ammunition, he will engage Louisiana guides, sleep in Louisiana hotels, buy gasoline at Louisiana filling stations, patronize Louisiana movie theatres at night, eat meals in Louisiana restaurants, get his cigars and cigarettes from Louisiana tobacco stores, and load up at last with Louisiana souvenirs to take back to the folks at home.

In the long run, every man, woman and child in the state will have had a share in the extra money that one man brought to Louisiana. Multiply him by the thousands, and you'll readily realize that the sportsman-tourist is a crop well worth cultivating. Fishermen from other sections of the United States built a billion dollars' worth of boats, piers, highways, resort hotels and things of that sort in Florida, and turned miles of a sandy waste of beaches into the richest gold coast in all this world.

WE HAVE THE GOODS

What those communities have, we have—and then some! You were told today that Louisiana winters about 90 per cent of the entire continent's supply of some types of game birds and migratory fowl. But that doesn't begin to tell the story of what we have to offer to the visiting sportsman that other and less fortunate communities do not have. And I'll say without fear of contradiction that if nothing else, we have better and more skillful guides than any other state in the union.

But if we let things go the way they've been going in the past; if we slaughter helpless deer that are driven to high ground by floods; if we who live in the country shoot quail out of season because we're afraid some city sport will get it ahead of us unless we beat him to it; if we who live in the city shine game with a headlamp for fear we'll have to go home empty-handed; if we encourage some poor devil to shoot more than the legal limit of ducks by buying his game; if we keep under-sized bass instead of throwing them back to grow up and propagate . . .

Why, if we do all those things we're just the same as taking every one of those millions of dollars our sportsman-tourist crop might bring us each year, and pitching the money into the deepest part of the Mississippi River. That's the plain every-day common sense of it.

So much for that. Just about this time you're saying to me: All right, Sam Jones, you've been telling us what we ought to be doing in this partnership. Suppose you just take and tell us what YOU'RE doing as your share of the deal.

That's a fair question. No one-way partnership ever amounted to a hill of beans in this two-way world, and one of these days a lot of dictators are going to find it out. So here's a report on progress to date by your partner, the state of Louisiana:

The first, and perhaps the biggest, thing we did was to realize from the very beginning that we couldn't intelligently operate the conservation of wildlife resources through a department whose main interest was mineral resources—oil, gas and sulphur. You know what the Bible says. Where the treasure is, there will the heart be also. There wasn't much treasure in protecting the few wild turkeys we've got left in this state, but there was a lot of treasure connected, one way or another, with oil and gas leases. And the hearts of past conservation agencies, to say nothing of the hands of some of the officials, were where the treasure was.

NO POLITICS INVOLVED

We're correcting that. We set up an executive director of all wildlife conservation, and there isn't a man in this hall that doesn't know Joe Partridge has done a swell job with the limited time and means at his command. Every last one of you knows that with about a third as many agents as before, the enforcement division of Joe's department had done just about three times as much work as before.

No, this hasn't been a matter of politics. When we found a good, experienced and conscientious game warden on the rolls, we kept him no matter who he voted for. And when we found a dead-head game warden on the rolls, a man that was drawing a salary when he didn't know the difference between a pintail drake and the West Side bleachers, we fired him, no matter who he voted for. Every day of this world we're training the new staff of game wardens in more effective methods for doing their work. And we're passing a civil service bill so that once we get competent and well-trained and efficient men organized into a proper staff, no politician will ever be able to fire them. That's one thing your new partner has done. Under the circumstances, I think it's only fair to ask you, on your side, to help those men do their work.

Here's another thing your new partner has done. We've earmarked $25,000 of state money for wildlife restoration by a special appropriation and the money's in the bank this good minute, waiting for some one to spend it. But that's not all. No, sir! There's $75,000 of money that didn't cost Louisiana a thin dime right there in the bank beside it; money the federal government put up to be spent in Louisiana at the rate of three federal dollars for every Louisiana dollar. And just to make sure that money is going to be spent for game restoration and nothing else, not a Louisiana hand is going to be laid on it. It will be spent under federal supervision. That money is going to be used to increase game, and not to increase votes. That's a refreshing novelty in Louisiana conservation funds, but I'm sure it's a welcome one. And our $25,000 appropriation that made it possible is the first of its kind in the history of this state. So that's another thing your new partner has done.

OUR PUBLIC ENEMIES

Here still another: We have organized a pollution commission, with competent chemical engineers on its staff, which is now working to clear away Wild Life's Public Enemy Number Two. Number One is the game hog, but between you folks and us folks in partnership, we'll take care of **him.** But wild life's public Enemy Number Two is stream pollution, and taking care of that is our job. We know and you know that it's not possible to tell all the big industrial plants—the paper mills, the alkali manufacturies, the oil refineries and the like—that they've got to pull up stakes and get out of Louisiana because they're polluting our waterways. We'd be the principal sufferers if those industries moved away.

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Louisiana's New Forestry Program Is Outlined

by
M. E. Brashears

Permanent economic prosperity depends on permanent social well being. Since the beginning of man's life, his very existence has depended on his association with land and the use of it and its products. Most of the instability of the economic and social system of today is due to the fact that man has not practiced protection, conservation, and management in using the land and the essential materials which it produces.

One of the most important developments affecting the economy of Louisiana today is that the forest products industries of the North representing millions of dollars in capital and offering employment to thousands of persons, are swinging to the South. The primary considerations in establishing industries entailing the expenditure of millions of dollars are a (1) continuous supply of raw materials and (2) transportation facilities.

This state is naturally endowed with transportation facilities which include intra coastal waterways, Mississippi river traffic, and international steamship navigation as far as Baton Rouge. Also, the State of Louisiana is well covered by railroads.

Wood material is produced faster and in greater quantities in this region than any other part of the country due to an abundance of rainfall and long growing seasons. The continuity of this supply depends not only on an adequate system of forest protection, but a good program of forest management as well.

That it is the duty of the state to carry out an adequate forestry program is shown by the following:

(1) Of all of the important industries in this state depending on nature for a supply of raw material, the wood-using industries stand alone in that the supply drawn from the forests can be perpetuated indefinitely on a sustained basis if properly handled.

(2) Most important to state economic and social welfare are the following facts, which are taken from the U. S. Bureau of Census of 1937.

M. E. BRASHEARS, State Forester

During this year, the forest products industries of Louisiana employed forty percent of all workers engaged in manufacturing in the State of Louisiana, and this group was paid thirty-five per cent of total wages received in the manufacturing industries. These figures exceed those of any other manufacturing group, including petroleum. Comprising the wood-using plants were 550 sawmills and about ninety other units that produced materials other than lumber. These non-lumber establishments manufactured poles and piling, gum and wood naval stores and miscellaneous products. Six pulp mills utilized 700,000 cords of pulpwood. Seven pulp mills are now in operation.

According to the U. S. Forest Survey, the forested area of Louisiana is 16,211,200 acres which is 56 per cent of the total land area of the State of Louisiana. Through improper cutting followed by repeated forest fires, 10 per cent of the pine lands are non-productive.

Worthy of note is that 3,427,000 acres, 21 per cent of the forested area, is in farm woodlands. This state has for years been considered an important agricultural state, and yet less than one-third of its area is in farm use now. Within the last decade, the agricultural land has diminished greatly. Most of these abandoned farm lands probably will not be returned to agriculture. Their reforestation, protection and management would decidedly be of definite benefit in farm economy.

Louisiana was once one of the outstanding states in the abundance and quality of its virgin timber stands. Now less than 10 per cent of the forested area is in old growth. About 10 per cent is almost entirely denuded and will become productive only through reforestation. The remaining forest lands are covered with second growth of wide degrees of sizes and stocking.

The wood volume increment of the forests as a whole are now showing a net gain over wood use depletion, but the greatest drain is on the saw-log size material. The larger and better quality products are those which are being overdrawn. Naturally, this increases the percentage of small and low-quality trees.

UNUSED FOREST WASTE MATERIAL CAN BE DEVELOPED

Utilization of the enormous quantity of unused, inferior, and waste material of the forests may be developed by chemurgy. Roughly, chemurgy may be defined as the application of science, especially chemistry and mechanics, in the finding of new uses for surplus and waste products of the vegetable kingdom. Wonderful results already have been obtained with cotton and wood. Instead of wasting over two-thirds of a tree in manufacture, it is possible that a process may soon be developed whereby trees can be ground into pulp and put through a chemical process, then be molded into hundreds of articles, including furniture and houses in sections.

Summarizing, the forest products industries of Louisiana comprise one of its most important industrial groups, employing more people and paying them more in wages than any other manufacturing group. Raw materials to continue these industries come from 56 per cent of the land area of the state. Most of this forested area consists of a second growth stands of which the larger and better products are being rapidly removed. Although the total wood volume increment shows a gain over depletion, the size and quality of usable material is being reduced.

To stabilize the forestry program and to insure this vital source of wood material which has a large influence on the social and economic welfare of the state, the individual, the State, and Federal agencies must cooperate in putting into practice certain fundamental requirements. First, a good system of forest fire prevention and suppression must be established on all forest lands. Beside the damage done to standing timber, denuded areas will not reproduce unless protected from fires. Proper management practices are necessary. A good program of forestry education and information should be carried on through schools, civic clubs, and the press. New industries must be well distributed and planned on a continuous supply of wood within their supplying areas.

Reorganization of the Division of Forestry has been made to carry out the State's obligations in developing a good forestry program. Branches of Education and Information, Fire control, and Management have been established. The Fire Control branch is being furnished with adequate fire fighting equipment and a better system of detection and suppression instituted. The state has been divided into five subdivisions, and district headquarters established with District Foresters in charge, for more efficient execution of forestry work. The state nursery will be enlarged and District Administration offices will be built with the cooperation of the Federal Forest Service. Farm forestry and forest farming operations have been set up in conjunction with the Soil Conservation Service and Federal Forest Service to assist the small owners.

The Division of Forestry gladly takes the initial steps in correlating the various factors necessary to full forestry stabilization in the state and will cooperate with all agencies to that end.

Forest Sabotage

Our forests and forest products industries constitute one of our foremost second line of defense assets. Many of the products of the forests are used in our defense program. Training camps are constructed of lumber and materials are transported in paper and wooden containers. Laminated woods are used and actual war materials are produced from wood. In case of invasion, the forests are invaluable as cover for our defensive forces as the British learned well in the Revolutionary War.

Last year 4,146 forest fires burned over 135,000 acres of Louisiana Forest land and caused damage upward of $200,000 on areas under protection. On areas not under protection, it has been estimated that 3,000 fires burned a million acres. Records kept by the Division of Forestry, Department of Conservation, show that 99% of these fires were caused by the carelessness of the general public. Winter killed grass and underbrush provide tinder for the don't-care smoker, hunter, brush-burner, and incendiary.

The Division of Forestry and forest land owners are making every effort to prevent and suppress forest fires. Their success depends on aroused public opinion. Just as surely as foreign or unpatriotic agents are committing sabotage in attempts on our munitions and other defense manufacturing plants, also is the public guilty in willfully or carelessly starting forest fires.

UNUSUAL FOREIGN BIRD CAPTURED IN LOUISIANA

A bird record of unusual interest resulted when J. N. McConnell, Director of the Oyster Division, brought to James Nelson Gowanloch a specimen of the northern Gannet or Solan Goose, **Moris bassana** (Linnaeus). This large sea bird, about the size of the Canada Goose and with a wingspread of six feet, has somewhat the appearance of a White Pelican since its general coloring is white with black primaries, providing black tips to the white wings.

The Gannet is a bird of the north Atlantic Ocean, breeding on islands in the Gulf of St. Lawrence off the coast of Newfoundland, Labrador, Iceland and the British Isles, wandering south in winter to the Gulf of Mexico, the Canary Islands and the coast of north Africa. Like the Brown Pelican but unlike the White Pelican, the Gannet plunges to catch its prey of fish.

Hitherto recorded as a casual winter visitor along the Gulf Coast of Louisiana, the only definite previous record seems to have been a male shot at the Rigolets on December 9, 1886. The present specimen has been turned over to Eduard Morgan and Ambrose Daigre of the Department of Conservation museum staff.

The Gannet nests in spectacularly concentrated colonies, and throughout the rest of the year wanders far at sea. It has been noted by the Chief Biologist of the Department on numerous occasions from 75 to 140 miles south of the Louisiana coast far out "over the blue water."

The present record is particularly interesting since the bird considerately came aboard the Department's Oyster Division boat, the Louisiana, on the morning of November 1st while the vessel was situated about a quarter of a mile offshore from the mouth of Bayou Scoffield. Although the weather had been normal, the bird was so completely exhausted that it was readily picked up by Captain Victor Sandras. It refused food and was found dead the next morning. The specimen was an immature bird showing dark grayish brown upperparts, white underparts and grayish brown feather edgings. The adult Gannets display a peculiarly beautiful breeding plumage wherein the head and neck are washed with a pale straw yellow. This plumage is not acquired for two or three years.

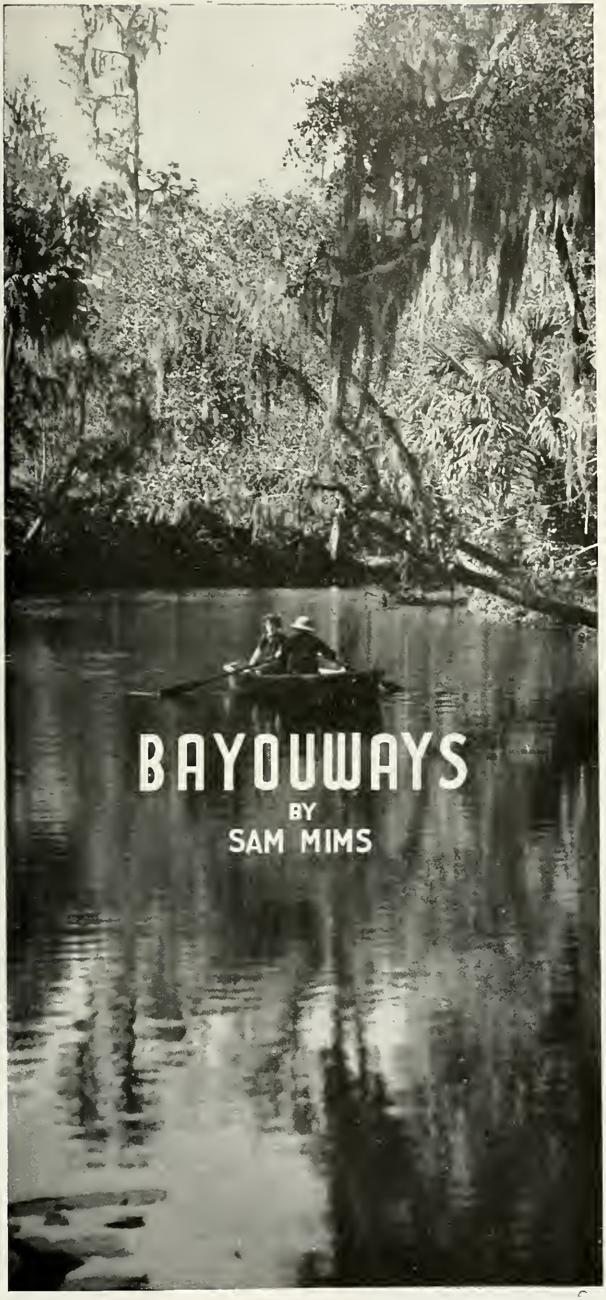
Gannets, noisy in their nesting grounds where they quack, grunt and whistle, are silent birds at sea, where from the deck of a liner they may be observed plunging as much as a hundred feet downward to catch the fish upon which they feed. Nor does their foray stop at the surface, for they have been taken in fishermen's nets at as great a depth as ninety feet.

Gannets are related to those odd birds, the Boobies, two species of which, the Atlantic Blue-faced Booby, **Sula dactylatra dactylatra** Lesson, and the White-bellied Booby, **Sula leucogastra leucogastra** (Boddaert), occur off the Louisiana coast.

Big game animals have registered a net increase of about 180 per cent on national forest lands since 1924, officials of the Forest Service state.

BAYOUWAYS

BY
SAM MIMS



Turn the pages of the current issue of any magazine and you are likely to find an article or editorial lamenting the fact that we Americans have become a "bunch of softies", and to our further discredit these lamentations are supported by reports from military men who have, during the past year, had occasion to observe and test the physical condition of thousands of young men. True, there are statisticians who attempt to minimize these derogatory conclusions by quoting figures to prove that today we have record-breaking track men, better football and baseball players, also that we have men with higher ratings in every field of athletics than at any time throughout our history. But even so, such statistics do not prove that **all** of our young men are superior in physical development to **all** of the young men of any other generation; it merely shows that while we have struggled to build up winning college and professional teams, composed of men naturally endowed with superior strength and agility, we have been neglecting the boys who sorely need physical development.

This somewhat appeasing, yet deluding, situation is not confined to the field of athletics, but it is discernible in all outdoor sports. For many years, all over the nation, conservation of wildlife meant the propagating and protection of fish and game in order that the fishermen would have more fish to catch and the hunter would have more game to kill. Only the skilled hunter and fisher got full benefit of the expenditure of vast sums that were appropriated for the conservation of wildlife, which implication may be assaulted by the retort that every person has equal privileges in field and forest, on stream and lake, and that no one is denied the right to avail himself of the benefits of conservation. Likewise, every youngster may have the privilege of playing football, but if he happens to be a weakling, greatly in need of physical development, he doesn't find himself carefully watched and trained by a high-salaried coach.

At the moment I'd be unable to articulate this piece because of an impaired vocal apparatus that received severe strain at a football game last Saturday night, increased in malignancy by unnecessary exposure while fishing a couple of days later, which statements are made for the purpose of clearing myself in advance of any charge of prejudice and intolerance toward sports.

OUTDOOR SPORTS NECESSARY FOR HEALTH BUILDING

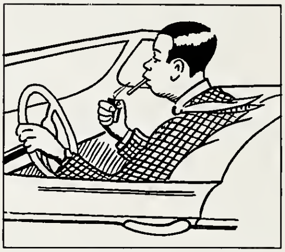
My plea is for the underprivileged nature lover, for the vacationer, for the artist, for the photographer, and for those thousands of individuals—men and women—who are too lazy and indolent to leave the highroads and their automobiles long enough to learn that conservation of wildlife, conservation of forests and streams can, and **must,** mean a great deal to them and their physically inferior offspring.

Students and workers in social welfare consider recreation a necessity. Never before in the history of our country has there been such determined effort to get people interested in playing outdoors. Health experts declare that if people of this and future generations don't engage in more strenuous outdoor exercises, that we will become a race of degenerates—and such declarations are made in spite of our enviable records in college and professional athletics.

Only a very small percentage of our population has any desire to fish and hunt and even a lesser portion of them care to play football or any of the other athletic games, and yet the adepts at these sports are the ones for whom great sums are expended in order that their pleasure be assured. And lest anyone get the idea that I am condemning such conditions, let me hasten to say that I wouldn't have a single fishing hole polluted or a single goal post destroyed. On the other hand, I am now thinking of the thousands of men and women, boys and girls, of this state and of the Nation who ought to be using, **every month of the year,** the thousands of miles of waterways that we have in Louisiana. The great throng of people who are looking for interesting modes of travel could do no better than to consider the rivers, bayous, lakes, bays, canals and lagoons of Louisiana. The artist can find no landscapes more beautiful than those found along our streams; the innate nature lover and the trained ornithologist can find in no other region of the United States a greater variety of feathered friends than live in the forest haunts along our bayous.

BEAUTIFUL VIEWS CAN BE SEEN FROM WATERWAY TRAVEL

With but little effort and comparatively small expenditures of money thousands of miles of water highways can be made available for people who are tired of assuming the hazards of automobile travel and who want to revert to the adventurous and romantic mode of transportation used by the rugged pioneer of a century ago. The bateau and the pirogue skimming over the lazy water of Bayou Teche have a charm that is not found in the most elegant automobile. From a swiftly moving motor boat a vacationer could see from the streams of Louisiana, during a period of two weeks, more beautiful settings, and experience more interesting situations than would be possible for him to perceive during five thousand miles of railway or automobile travel in any region of the United States. A family touring the bayous, lakes, canals and lagoons of Louisiana in one of the half dozen types of light water craft, would get more genuine recreation, more hardy enjoyment, and greater physical conditioning than they could through any other mode of travel.



During the past few years our youngsters have been encouraged to pity themselves. They need an infusion of pioneer spirit. They need to emulate Tom Sawyer and Huckleberry Finn.

I can scarcely imagine a trip more thrilling and adventurous for a group of young men than one by way of a fleet of rowboats down a bayou or river that leads to the Gulf. It would be unique experience for them. They would, after a few days, become proud of their calloused hands and rejoice over the discovery that power is concealed in their youthful arms. Their latent pride would be aroused, and they would find joy in the realization that the seat of their pants is not the only part of their raiment that should suffer from wear and tear. This country needs some Tom Sawyers and Huckleberry Finns; and another Mark Twain for these troublous times would be a genuine blessing. We may never again follow the winding pathway of the Father of Waters aboard the old river packets made famous by Mark Twain and Lafcadio Hearn, but we can lure pleasure seekers and vacationers into using our streams with which we are so lavishly blessed.

Several government agencies are combing the country for park and parkway sites. Ancient trailways and Indian traces are being retraced from musty old maps, and every spot of historical value is being marked for future reference. Millions of dollars have been spent and still more will be spent to expand recreational facilities. Thousands of pages have been written to inform the vacationer about

■ Distant vacationers will be amazed at the beauty and vitality of these lovely "obstructionists".

(Photo by W. S. Robinson.)*

how he can get from **here** to **there** as quickly as possible, but little has been done to make him understand that what he most needs is a slowing down of tempo, complete relaxation, a change of mental diet, along with intervals of solitude.

THOUSANDS OF MILES OF NAVIGABLE STREAMS IN STATE

Our waterways have already been built. They were not built by the hands of man. Perhaps that is the reason why streams are so romantic, so poetic. The most tranquil streams in America, and yet, the most charming are those that move slowly, but majestically, through our State, where, "trailing mosses in midair waved like banners that hung on the walls of ancient cathedrals," and where, "the whole air and the woods and the waves seemed silent to listen," and where, "one is lost in a maze of sluggish and devious waters." Perhaps no other romance will live longer on the pages of literature and in the hearts of future generations than "Evangeline". The fact that it was drawn from history that was partially enacted in our State, provides a stimulus for us to inaugurate waterway tours through this region where live today descendants of the Acadians who provided the motivation in this great epic poem of Henry W. Longfellow's.

There are more than four thousand miles of navigable streams in Louisiana

■ This is Tensas River. One of the many picturesque rivers in Louisiana. There are over 3,000 square miles of water in the state.

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* Drawings by Roy Odom.

and in all of them boats operate during some seasons of the year; we have a total area of 3,094 square miles of water, nearly all of which can be made attractive to sportsmen and vacationers.

But while admitting that Providence has been kind to us, we must not deny our own derelictions. We have not given much assistance toward keeping our bayous and rivers clear of obstructions. We are guilty of poisoning them through our feverish desire to expand industries. Many of our streams are polluted during a part of each year, generally in the summer and autumn while there is not sufficient rainfall to dilute poisonous fluids that flow from pulp mills, oil fields, and sugar mills. And for this reason we are not ready to advertise that waterway conditions are ideal in Louisiana—not until industrialists and agents of the Conservation Department have perfected a plan to protect the streams from contamination. But progress is being made and satisfactory results may be anticipated, although the problem is a difficult one.

HISTORY AND TRADITION HAVE MADE US UNIQUE

There is another obstacle to navigation in Louisiana that will seem strange to people who have never visited our state, and all prospective vacationers from beyond our borders will be amazed to learn that hyacinths grow so profusely that navigation in many streams is seriously impeded. But think of the effect of such advertising as: "We have at last succeeded in cutting boatways through the water hyacinths that obstruct our bayous. These flowers are beautiful, but they grow so luxuriantly in Louisiana that we are forced to cut through them in order that your bateau may glide along safely." Major R. G. Lovett, district engineer at New Orleans, says: "We have the hyacinths under control now. We have given up hope of ever exterminating them, for they grow in the deep swamps and every high water floats them out into the navigable bayous and waterways. But with our present facilities for destroying them, we can keep them under control from now on." And so, with assurance, we can say to vacationers, "Don't be afraid that our lovely lillies will spoil your boat trip. Their pastel shades against a solid carpet of green will delight you."

SOME DAY WATER HYACINTHS WILL BE ONLY DETERMENT

We should begin the planning of boat tours in anticipation of that day when water hyacinths will be the only enemy to the navigation of small craft through our thousands of miles of waterways. There must be parks and camps along the way. There must be entertainment provided, a la Louisian. Rice festivals, sugar cane festivals and tarpon rodeos are typical of Louisiana, but the bulldogging of bovines is borrowed from the west. History and tradition have made us unique, which should prove quite valuable when we begin inviting vacationers to use our boatways.

Perhaps no cash value can be definitely assigned to waterways for pleasure purposes, yet who will deny the value of stream improvements for such purposes?

Adult salmon on their way to the spawning grounds always swim against the current. No power on earth will force them to swim with the current. They will dash themselves to death against dams and other obstructions in their efforts to get upstream.

Protect Game and Fish. It pays dividends!

■ **To make navigation possible, lanes must be cut through hyacinths that cover some of our bayous.**

(Photo by W. S. Robinson.)

■ Mrs. Sam Jones, First Lady of Louisiana, is an enthusiastic angler and lover of the outdoors.

A Woman's Angle On Angling

By Mary Land Lock

Women think, for some inane reason, that fishing is a man's sport. This misconception has been planted in the female mind for generations. The principal reason for this malignant attitude on man's part is the fact he recognizes woman's ability and cannot stand to have his piscatorial glory taken away. Some men still retain the archaic idea that woman's place is by the fire side with her knitting, listening wide-eyed to his outrageous and mythical fish tales. A woman's gullability always turns to ability after her first angling experience. Men realize this danger and will go to any extreme to keep a rod out of a female hand. They strongly oppose any close contact with their precious fishing equipment. Some men even go into acute and violent attacks at finding one of their wooden minnows moved a third of an inch in their tackle box.

If you wait for your male companion to encourage your angling activities you will be an old woman with long white hair and too feeble to hold a rod in your hand. The sensible approach to becoming a fisherwoman is first of all, and most important, to get the male member of the family out of town on one of those business trips that bore him so. Once he is off; gather up his pet tackle, find a clear spot in the back yard and swing out. The neighbors may think you a psychopathic prospect but do not let this discourage you. Your casting a fly into a rose bush is not half so imbecilic looking as the carressing of flys and plugs by men during the months of their fishing confinement. When you have learned to avoid most of the shrubs and trees and keep the fly out of your hair, find a stream or lake and catch your first fish. Always keep the thought in mind that men may have technique but women catch the fish. The first time I casted a plug in my life I found a nine pound Snook (Robalo) on my hook. In my hysterical state my reel came off my rod, I slipped three feet down the Tamiami Canal bank and lost my hat in the canal but managed to bring Mr. Snook in. Men never seem to have experiences like this and their angling must be pretty drab at times. You will return from your solitary fishing trip with a substantial catch, a sense of independence and a general "Columbus-like-feeling". This new-world discovery will ruin your boy friend's fishing fireside chats but will give you both happy days of outdoor companionship.

WHEN WOMEN GO FISHING THEY MEAN BUSINESS

Women should be capable of far more enjoyment from fishing than men because of their sense of appreciation of beauty. A man will make his kill, guzzle a bottle of brew and blindly head homeward; a woman will be satisfied with one small perch and linger to revel in the infinitesimal loveliness of the bloom on Spanish moss or the haunting song of a rain crow at dusk. Our Governor's Lady is an outstanding example of a beauty-loving angler. Louise Jones brags she has never caught a fish over eight inches because the hours on her fishing trips seem to be taken up with sunrises and the soul drenching satisfaction of the outdoors. In her creel one will find a sting of memories as vivid as our salt water trout or dolphin, and far more lasting.

Complete relaxation comes with any water trip. Gulf trips make one feel a part of the blue green mysterious depths; every turn in a bayou is a fantastic panorama. Louisiana has three thousand miles of lakes, ponds and streams. Every parish is replete with fish and beauty from the copper colored hills and fast flowing streams of North Louisiana to the delicate shaded cypress swamps and quiet lagoons of the southern part of our State. Our list of Louisiana fish reads like a Florida advertisement. Large and small mouth black bass, several kinds of perch and bream, catfish, Buffalo and White Perch (Sac-a-lait or white crappie) are found in the lakes and streams of North Louisiana. In the bayous, lakes and rivers of South Louisiana an angler may have the unusual experience of catching salt water and fresh water fish on the same bait. The fish abounding in these waters are: sharks, tarpon, redfish, croakers, lady fish, salt water trout (weakfish) green trout (black bass) sheepshead, catfish (salt and fresh water), perch, rays, flounder, pompanos and many other.

Mrs. John G. McCloskey, New Orleans, who has won several bait casting contests in competition with men.

Our gulf waters offer such sporting fish as: tarpon, jack fish (cravelle), king and spanish mackerel, bonito, ling (cabio or lemon fish), sharks, dolphin, red fish and blue fish.

WE LACK QUANTITY BUT WE HAVE QUALITY

Of the fishing licenses sold in Louisiana only five percent go to women. However, our loss in quantity is redeemed in quality. Louisiana can boast of many superior fisherwomen. In the city of New Orleans Mrs. H. F. Collister heads the list with a record of winning the Ladies Trophy for the 1938 and 1939 City Limits Rodeo, sponsored by The New Orleans Tarpon Club. In both events Mrs. Collister landed tarpon which were the envy of her men companions. Mr. and Mrs. Collister have also accomplished the feat of boating tarpon hooked at the same time, and gaffing each others fish. In 1938 Mrs. Eleanor Pratt won second prize in the City Limits Rodeo with a 78 pound tarpon. There were 5 women registered in the 1940 Rodeo but no tarpon caught by a woman. The City Limits Rodeo lasts from June until October.

The Grand Isle Rodeo is the oldest of all State Rodeos. It is sponsored by Alker Donovan Co. and is usually held in August. In 1939 Mrs. George Thomas gave her competitors thought and worry by winning a trophy for a large silver king. Mrs. Sylvester La Brot landed an 84 pound tarpon in the 1936 Rodeo and won a trophy. Mrs. La Brot and Mrs. Thomas won their trophies in competition with the men as this Rodeo has no special award for women. The Grand Isle Rodeo lasts three days.

The Louisiana Department of Conservation and The Item Tribune originated and sponsored the tarpon rodeo at Southwest Pass, New Orleans. Twenty-three tarpon were boated in the 1940 rodeo, all, strange as it seems, by men. Five trophies and 22 certificates were awarded in three days fishing. The largest tarpon caught on each of the three days was mounted by the Conservation Museum taxidermy staff and presented to the angler. The Item Tribune gave a trophy for the largest tarpon caught. The official rodeo judge, Miles A. Pratt, donated a trophy for the angler catching the most tarpon. In addition every angler landing a silver king received a certificate for his catch. During the rodeo eight tarpon were banded by the United States Bureau of Fisheries in cooperation with the Department of Conservation. The Item Tribune and Department of Conservation hopes to donate a special ladies' trophy for the 1941 Rodeo. One of our Louisiana fisherwomen should win this trophy and to add a dramatic touch she should win it with one of the banded tarpon.

The author of this article, Mary Land Lock, with the trophy she won in the Lake Charles Tarpon Club Rodeo in 1937. She is the only woman in the state ever to win a rodeo in competition with men.

WOMEN HAVE A SAY SO IN WINNING TROPHIES

Lake Charles women seem to catch more tarpon than any other women in the state. Perhaps the cajun method of bare-foot-fishing has something to do with their success. Seventeen women fished in the 1940 Lake Charles Rodeo and forty-nine men.

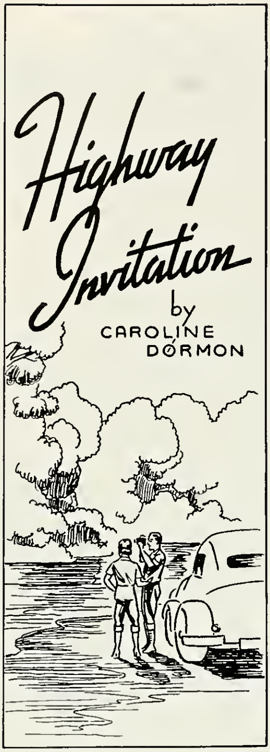
Mrs. Wendell Castle, an ardent anglewoman of Lake Charles, won the ladies cup with a hundred pound tarpon. Claude Hamel of Shreveport won first place for the men. There were seventy-nine tarpon caught in this year's Rodeo, a record hard for any Rodeo to beat.

Our Louisiana women are not all salt water anglers. Many in the state can whip as wicked a fly line as the best man. New Orleans is proud of the record of Mrs. John G. McCloskey. In 1935 Mrs. McCloskey won first prize in the City Park Bait Casting Contest. Mrs. McCloskey won again in 1936 with a third place for a two pound black bass competing with forty-eight men and women. City and Audubon Parks offer New Orleans anglers ideal and convenient fishing waters. In North Louisiana there are large numbers of fresh water fisherwomen. Mrs. Gammon G. Nesbitt of Shreveport is nationally known for her hunting and fishing.

With five million acres of water and the unspoiled loveliness of Louisiana, all women should fish winter and summer. Why should your husband clutter up the house with his dull, rusty trophies when you can ornament your library shelves with your very own.

Highway Invitation

by CAROLINE DORMON



Do visitors from California come to Louisiana to see eucalyptus and wild lilac? Are New Englanders excited over homesick spruces and hemlocks? Do travelers from Detroit or Kansas City or Cheyenne drive hundreds of miles to look at clipped ligustrums and neat arbor vitaes—which they can see in any town or city in the United States? Well, hardly.

From the comments I have heard, and the questions I have had to answer, my conclusion is that they come, one and all, with a thirst for something romantic and colorful, something typical of the "Deep South". Without exception they bring a long-felt desire to drive beneath majestic live oak arches, swinging delicate banners of Spanish moss. Of course they simply **must** see and smell the great creamy blooms of magnolia. They revel in the sight of lavender water-hyacinth, blanketing every bayou and lagoon. To most Louisianians the latter represents only a nuisance; but if seeing the flower for the first time they would consider it as lovely as an orchid.

Since Julia Peterkin and other Southern writers have had so much to say about yellow jessamine, vistors in early spring look for its fragrant flowers: but only in the hills will they find this dainty vine. There it spills its gold over every bush and tree, and even cascades down steep banks along the roadside. Our wild iris, too, have been given the front page since Dr. J. K. Small found them here in 1925. And well they deserve their fame. Here, in wild profusion, are growing more varieties of this gorgeous flower than can be found in any other locality in the world. And they are easy to grow. One wonders why they have not been planted along every bayou, lake, and ditch-bank in the state. Oh, what would California have done with such a flower!

". . . It is a joy to drive through this beautiful hardwood forest". Hardwood Forests supply year-round beauty.

NEW AND OLD FLOWERS ARE ABUNDANT IN STATE

These expected joys we can give to tourists, and much more. The lagniappe they get will exceed the purchase. Have they seen our wild mallows, white, pink, red, and yellow—some with blooms as large as a breakfast plate? They know that dogwood and fringe tree grow in other states, but have they heard that they also whiten the hills of Louisiana? And there are crabapples, delicate pink in spring, deliciously sweet, and hung with little yellow apples in the fall. In some places they form veritable thickets. Along old roads in some localities the famous Cherokee rose wreathes, fences and trees in shining green, its long streamers set with big white blossoms. (This lovely vine is often confused with the McCartney rose, which is not native, and which becomes a nuisance. The two are enough alike to explain the confusion.)

We can offer not only our fine old **Magnolia grandiflora,** but four other species beside, in addition to their handsome cousin, the tulip tree. Our wild pink and white azaleas are abundant and exquisite; and in one part of the state the closely related mountain laurel grows. The latter is an attractive evergreen—which brings up a whole new list.

Of course live oak and magnolia lead the evergreens, with holly a close runner-up. Then there are the holly's attractive little sisters, yaupon and dahoon; and still another, inkberry, with black fruit. There are cherry laurel, wild sweet olive, and horse sugar, star anise and andromeda.

These all belong to the so-called "broadleaf evergreens", which do not, of course, include our beautiful stately pines. Longleaf, loblolly, shortleaf, slash and spruce pine are all attractive. The last gives us the lovely little "Christmas trees" which stand out so soft and bright green against the white sand banks of streams in Southeast Louisiana. Nothing could be more beautiful than a virgin forest of longleaf pine, but such forests are almost gone. However, the "cutovers", which long presented such a sad appearance, are coming back. There are now many areas protected by the Government, either Federal or State, and these softly rolling hills are clothed again in green, the glistening fountains of young longleaf and slash pine.

Some of our main highways pass through these vast areas. Follow one of these drives with me in late March or early April. If it is your first trip, you will catch your breath at what you see in the scorned "cutovers". Every dip and hollow is filled with dainty pink

Catalpa trees became a mass of bloom in the late Spring.

(Photographs by the author.)

azalea, fragrant, exquisite. (How we coddle and coax the gorgeous exotic azaleas, yet never even try to protect these wild beauties—permit fires to kill them back year after year!) Lift your eyes across the blue hills, and see the slopes snowy with dogwood, misty with fringe tree. In certain spots, where the soil is a little heavier, there is the flush of crabapple, in sweet masses by the roadside. The ground is a carpet of wild phlox, verbena, and birdfoot violets.

Beautify these highways? Why, it comes down to little more than protecting what is already there and thriving. If this be saved from fire—**and** goats—in a very few years these will be drives to linger in the memory of those who come to see. And the natural growth, mats of yellow jessamine, tiny wild rose, gooseberry, and the numerous lespedezas and wild peas, will hold the light soil and prevent erosion. Of course a small amount of judicious clearing out of undesirable growth, and grouping **more** dogwoods, cyrillas, fringe trees, yaupons, and crabapples along the roadside will expedite matters.

DRIVES THROUGH HARDWOOD FORESTS ARE BEAUTIFUL

Improving the highways through our magnificent hardwood forests is an even simpler problem—in fact, no problem at all. "Hardwoods", of course, is a term which simply means all the trees not palms or pines, and embraces the beech, elms, lindens, maples, our twenty oaks, and scores of others. The only thing needed is intelligent selection, and care of those preserved. In our haste to get good roads, we have sacrificed some of our finest trees. A naturalist driving from New York to see the great-leaved magnolia (Cucumber tree) must be nonplused at seeing **stumps** of this rare species, while sycamore saplings have been carefully preserved. Sycamores are pretty, but common everywhere; while **Magnolia macrophylla** is probably the most spectacular ornamental tree in the United States.

■ Beneath Live Oak Arches. These fine arches are a heritage from the past.

Wild Hydrangea is beautiful massed along the roadside.

Many fine hardwood forests have never been cut over, and offer varied beauty along our highways, as well as welcome shade in summer. If properly approached, no doubt most landowners would donate a strip of woods on each side of the road, which could then be placed under state protection.

Most forests of this type occur in rich bottom land, where the colorful redbud thrives. Where natural openings occur, and along the right-of-way, redbuds can be massed with fine effect. This is being done in many places, and the vivid color, while all the woods are bare and brown, attracts much attention.

Of course there are long stretches of highway where there are no trees at all; prairie land, or regions widely cultivated. Here actual planting is needed . . . but why not still hold fast to our own native trees, shrubs and vines? The various species offer year-round beauty; blossoms and tender leaves in spring, refreshing green and more blossoms in summer, a blaze of autumn color, and glossy green and bright berries in winter.

MUCH PROGRESS MADE ON PLANTING FLOWERS

In some parts of the state, long avenues of live oaks and magnolias have already been planted, and where the soil is rich and heavy, nothing could be finer. In years to come, the dignity and beauty of these drives will be unsurpassed. Of necessity, trees of this type must be wide-spaced. If a quick effect is desired, informal clumps of redbud and crepe myrtle can be planted in between the slower growing trees. These two are low and spreading, grow rapidly, and supply color from earliest spring until late fall. (Crepe myrtle is a native of India, but has taken so happily to our soil and climate as to seem one of our own flowers.) On curves and bridge approaches, where height is not desirable, red-berried yaupon and dahoon may be massed; and wild sweet olive, andromeda, St. Johnswort, wax myrtle, wild mallows, and many creeping vines.

Other states are playing up their own trees and flowers—California and Florida have long been famous for theirs. Yet the flora of Louisiana is as varied and beautiful as that of any state. Probably Texas and Florida can boast a greater number of species, because of their sub-tropical areas, but ours are just as lovely. Louisiana has made a beginning, but there is much more to be done.

Texas now has a well organized program of native planting along highways, and Oklahoma is following close behind. The tourist trade constitutes one of Louisiana's most paying "crops". Shall we cultivate this crop? Are we going to let tourists who come to "Lovely Louisiana" go away with a vague feeling of disappointment? Airline highways are fine for getting places; but wouldn't a live-oak-line get one there just as quickly—and leave something for memory to feast upon?

Just what do you remember most vividly about certain places? Say "Tampa", and the words, "palms, scarlet hibiscus, flame-vine" flash on in your mind. "California . . . sequoias". "The Teche . . . live oaks". Planting with distinctive charm, something which sets one place apart from another is a thing to be desired. Tyler Texas now has a Dogwood Trail. Shreveport has a Redbud Drive. Why not, somewhere in Louisiana, a Crabapple Lane, a Palm Avenue, Magnolia Drive, Lotus Lake, Azalea Dell, Iris Trail? We could have a Parkway of Pines from one corner of the state to the other—with all that goes with the pines.

Shall we give visitors to our state a vision and a dream to take away with them? Or shall we just let them pass through—**on their way from Florida to Texas?**

Passage of the Buck Bill extending Federal aid to the States in fishery restoration project is seen at the next session of Congress by Carl D. Shoemaker, Secretary of the Special Committee of the United States Senate on the Conservation of Wildlife Resources.

■ Delicate pink clusters of the honeysuckle azalea.

■ Undulating patches of the windflower primrose.

■ The flowering dogwood with its white outspread arms.

■ Roadside flowers no end.

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Louisiana's Need for a Wild Life Experiment Station

by
Percy Viosca, Jr.

Nature's Crops: Biologists are concerned chiefly with those natural resources which renew themselves automatically. Forests, fishes, fur-bearers and game are Nature's crops, which, although exhaustable, are capable of being conserved either by restricting the rate of taking them, or by artificially increasing their rate of reproduction. In the past, wildlife has been considered more or less as a bonus, to be secured with little effort; but as more and more time, labor and money becomes necessary for reaping the harvest of Nature it soon ceases to be a bonus at all. Today, in Louisiana as elsewhere, more and more people are securing with greater and greater effort this rapidly diminishing bounty of Nature. In many cases the cost of taking a species far exceeds its actual value, and the taking is treated as a sport, a sort of by-product of outdoor recreation.

Dynamic versus Static Conservation: The day is at hand when "dynamic conservation" must take the place of "static conservation," when the management of biological resources must largely supercede the original methods of conservation by solely restrictive measures. More and more will wild organisms have to be artificially controlled in some way to the end that larger natural crops will be produced. To succeed in this, much attention must be devoted to the effects of environmental adjustment. With increasing predation by man, the productivity of the areas of land, marsh and water available for each important species or group of species should no longer be left to Nature.

Wildlife inventories needed: A good cattleman knows how many cattle an acre will support; a farmer knows something of the productivity of his acres in various crops; but very few states have ever taken inventories of their wild life stock in trade. We possess almost no knowledge of the standing populations of our forests, lakes and streams or the number of each species that may be removed annually as a crop without upsetting nature's balance. Many millions of fish are planted annually by state and federal departments and private organizations without any knowledge of the numbers already present in the waters, the numbers the waters can actually support or the assortment of species that should be planted. Machinery for gathering this information must be put in motion at once if we are to succeed in wildlife restoration.

Husbandry versus Spoliation: In the consideration of wildlife resources as crops rather than bounties, husbandry must take the place of spoliation. Problems of biological rehabilitation must be solved and largely supercede legislative restrictions before we can stabilize the industries based upon these natural crops. As the environmental requirements of our most important wild species are as yet little understood by biologists, much less by the political bodies charged with the duty of conserving them, we must acquire the knowledge necessary for developing these resources. Research, or the common sense accumulation of facts, must become the foundation for a sensible plan of utilization.

Many Questions Are Asked

Unanswered Questions: For many years the Department of Conservation has been deluged with many questions which it was not in a position to answer. Examples such as the following reach this department almost daily: "How many bass can I raise in an acre of water?" "Why is that for three years my pond produced all the fish my friends and I could catch and today I cannot even see a fish?" "What kind of vegetation is best in a fish pond; a duck pond; a frog pond?" "What are the best duck foods to plant in brackish water; in fresh water?" "Why is it that muskrats have practically disappeared from my marsh and ducks do not stop any more? Muskrats have become so plentiful that they are destroying their feed crops; what shall I do?" The status of the Conservation Department in the eyes of the people will be greatly enhanced when it can give intelligent answers to such questions.

New Establishment Needed: The biological laboratories at our educational institutions are not equipped to study the inter-relationships of Nature and the reproductive and food cycles of organic life on a sufficiently large scale to give intelligent answers to such questions. Louisiana is in urgent need of a biological establishment where the productivity of the different economically important wild plants and animals can be determined on an acreage basis under different practical conditions, just as a farmer needs to know how much corn or cotton he can produce in a given soil with a given amount of fertilizer. In such an establishment the many facts of pure science accumulated in the biological laboratories during the last quarter of a century of conservation's progress can be made available to the public by sufficiently large scale practical application.

Benefits to be Derived: Such research will point the way to the profitable use of many idle acres of land and water in our state; to the utilization of many new products derived from now unused resources; to the building up of new natural resource industries. Applied biology resources is really the next frontier of science and in it lies the solution of many of our unemployment problems; opportunities for investment, increased recreational facilities and the general betterment of our social and political organization. The state can be of no greater service to its people than by showing them these ways and means of creating new wealth from its soil and water, our greatest natural resources. The pressing need, therefore, is not simply for another laboratory for experimental biology, but for a new type of establishment so organized and equipped that it can coordinate and synthesize the work of our other biological institutions and apply it in a dynamic way for the immediate benefit of our people.

Example of Procedure: The following is submitted as a practical example of the experimental procedure to be followed at a biological station of this kind: A large number of plants and animals, including their parasites and predators, occur in waters in which black bass are found. We know in a general way that some of these encourage bass propagation and growth, others hold them back or tend to reduce them. In a series of ponds, of say 1/10 acre each, methods of rearing, in pure or practically pure culture, must be worked out for those food chain organisms in the black bass cycle which show most promise. Then variables must be introduced, such as more or less fertilizer of different sorts, more or less shade, different depths of water, different combinations of species. Once suitable combinations of factors are arrived at, they can be experimented with further in one acre ponds and then black bass introduced. With complete control of the factors involved, including the number of bass present, definite systems of culture can be worked out, the results to be published in bulletin form for release to the public. The work must not stop here. Culture methods must be worked out for bass with parasites and those free from disease in order to find out to what extent, if any, parasitism is detrimental to bass propagation. Then species believed to be harmful, such as water hyacinths, alligatorwood, gars, catfish, carp, etc., should be introduced to find out the part each plays, if any, in keeping down our bass population.

Bass Need Minnows

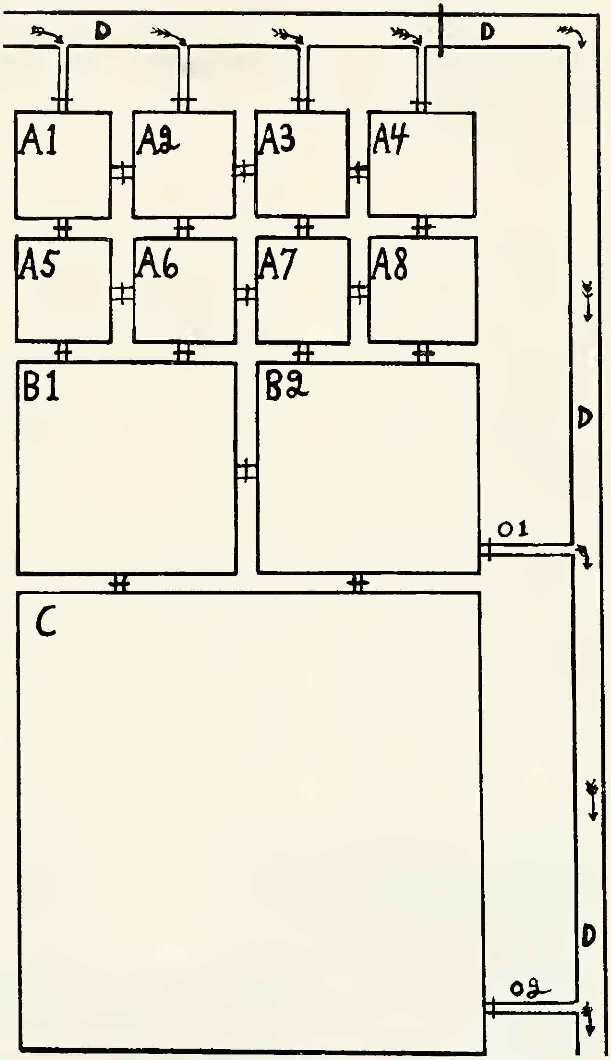
The time is not far distant when the sale for bait of minnows caught in the wild state will have to be prohibited as this is an enormous drain on the natural food supply of bass. Methods of culturing bait minnows must be worked out, not only to teach the public how to rear this bait in captivity, but, as minnows are the final link in the bass food chain, the tonnage per acre possible with different minnows will have an important bearing on bass productivity. Similar methods of culture, through progressive steps, must be worked out for other important game fishes, for bullfrogs, muskrats, wild duck feeds and other wildlife resources.

For the most part, fish culture of American warm water fishes has been a failure. Most fish hatcheries have been an idle gesture to appease a public demand, and they have been lacking in results figured in terms of fish taken by anglers. In Louisiana, no authentic records of productivity have been kept and such haphazard methods have been used that the state cannot say how many pounds of bass or bream it can raise in an acre of water. Hundreds of thousands of dollars have been thrown away with little or no benefits accruing to the public. Such waste cannot be prevented until systems of fish and game management, based on the results of such biological research as herein proposed, are evolved and become common knowledge.

Proving Ground Needed

Our educational institutions are turning out students with a bent for this sort of work, but they have no example to follow and no prospects for employment until the results of such experimental procedure are made available to the general public.

Summary: Louisiana needs a station for the study of experimental biology on an acreage scale and its application to the problem of "dynamic conservation."



EXAMPLE OF MODEL FISH FARM FOR EXPERIMENTAL STATION

D, Irrigation ditch; 01 and 02, outlet ditches; A1 to A4 Water flea ponds; A5, Bass brood pond; A6 to A8, minnow ponds; B1, bass fingerling pond; B2, finishing pond for large minnows; C, bass finishing pond. Cross bars indicate water gates. Under such a system, all plants, and all live foods are raised in captivity and a reserve supply of all species is always at hand. The main additions from outside sources are various forms of fertilizers. Shrimp, crawfish, and other food items can be substituted for the minnows.

Influence of Weather Conditions On Bird Life

by
Ambrose Daigre [*]

Food is a vital factor for the maintenance of life among all living organisms; and this is no less true of birds. Some members of the avifauna consume more than their actual weight in a day. Therefore, since the freeze of winter causes a dormancy in the insect kingdom, it is logical that insectivorous birds must move to a habitat where insects abound. With the approach of autumn, there is a steady movement southward. Many speries of birds that are resident to Louisiana during the summer months, and others that are transients during the spring and fall migrations, wing their way to a food paradise in South America to spend the winter. The regular spring and autumnal movement of the avifauna is a natural thing, and is termed migration.

Apart from these natural semi-annual pilgrimages northward in spring, and southward in fall, sporadic fluctuations, resulting from weather changes, cause the birds to make trips north and south during the period of residence in a specific region. These movements are particularly characteristic of ducks,—to such an extent, in fact, that observant hunters rely upon them to foretell weather conditions. To notice them moving southward in midwinter is an omen of cold weather; whereas a movement northward is indicative of a warm interval.

Severe cold weather, accompanied by sleet and snow, such as that which we experienced last winter, takes a terrific toll of birdlife. Moreover, it causes many strange movements by birds. To most of us, snow is a thrilling experience; but to nature lovers it furnishes a fascination which can not be expressed in just so many words.

At the very outset of last winter's severe cold, I chanced to be in New Orleans. On the day before the advent of the snow, I began a trip from New Orleans to Alexandria. At approximately half way between Laplace and Baton Rouge, I encountered mixed sleet and snow, increasing in density as I drove northward. By the time I reached Baton Rouge the sleet and snow had become so severe that I was forced to spend the night there.

The following morning, on resuming my trip, I discovered that there had been such a heavy snow fall north of Baton Rouge that travel was greatly retarded.

Flocks of ducks were flying around in apparent dismay, searching for uncovered feeding places; and such birds as congregate at that time of the year, including redwinged blackbirds, grackles, cowbirds, starlings and pipits, were foraging for food along the exposed ditch banks of the highway.

Upon arriving in Alexandria, I found that huge flocks of purple finches were feeding on the berries of the ligustrum trees in my yard. Although I have studied birds nearly all of my life, this was an entirely new experience for me, because purple finches are quite uncommon in Louisiana. Mr. George Lowery, Jr., stated that he observed thousands of Lapland longspurs just north of Baton Rouge. Inasmuch as this bird is only a casual winter visitant to northern Louisiana, its appearance that far south in the State is indicative of the fact that the birds were pressed southward by a scarcity of food due to the snow. It was my observation that after a lapse of several days, I found many ground birds dead in all the country adjacent to Alexandria. Kildeers, flickers, meadowlarks and other ground dwelling birds were found frozen stiff on the snow. And why did so many birds die? Not from the severe cold? Oh, no, they actually starved to death. Their bill of fare was just under that beautiful white blanket.

This Department makes a plea to the people of Louisiana to do their part during such cold spells to save our birdlife. Feed the birds. Farmers can build straw hutches in their fields which will serve a two-fold purpose—provide shelter and serve as a feeding station if corn be strewn in them.

From an aesthetic, if not from any other viewpoint, birds deserve our utmost attention and protection. Game birds furnish us with many hours of pleasant sport, not to mention how delicious they are on our tables. Insectivorous birds control the insect world. If it were not for these birds, the earth could not be inhabited by man; harmful insects would become so plentiful that the entire plant kingdom would be demolished.

Besides the usefulness of birds, and the pleasure they bring us as beautiful creatures, they also provide us with beautiful song. What would this world be without birds? Please help us to protect them.

Alvin Sandefur, Gold Dust, La.

"The Review is the finest magazine towards the interest of conservation and the conserving of the natural resources of Louisiana published. It shows the people what an interesting state in which we live and to enjoy nature."

". . . Severe cold weather, accompanied by sleet and snow, such as that which we experienced last winter, takes a terrific toll of birdlife."

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[*] Taxidermist, Dept. of Conservation.

Wildlife Conservation Essential to Agricultural Development

by
Fred Williamson

(Photographs by John S. Campbell)

"Folks must eat. If grass weren't green, we wouldn't eat. Grass and all vegetation is green because of the chlorophyl cells, and these cells constitute the bridge between sun, soil, air, water and living animals. We learn about chlorophyl in high school and promptly forget both the name and all its important functions in human existence. This forgetfulness is the reason for a whole lot of our troubles, as a nation, as a species, as inhabitants of the good green earth. Who would think that chlorophyl had any relation to millions of unemployed? And yet its functioning or lack of it, is probably more important than the Wagner Act. Could we get far enough away to study the planet earth through a telescope, we'd see the green patches growing smaller, year bv year, with new man-made deserts being added to the areas that once supported life, in Asia, Africa and the American dust bowl."*

Those increasing areas of unproductive waste lands, devoid of water, barren of vegetation and forsaken by humanity, should be a conscious object lesson to us whether we are hunters, fishermen, naturalists, or plain business men. We talk conservation because our minds are gradually absorbing the fact that it means something more than hatching game birds and turning them loose, something more than dumping infant fish into lakes and streams, something more than arresting small boys for shooting robins.

Quarter of a century ago Theodore Roosevelt said, "When the topsoil goes, man goes." He made the first national plea for recognition of the chlorophyl fact. From the raw inorganic matter of this earth vegetation must first draw the essentials of life, transform it into organic matter before man or any living thing can use them as food. Man's digestive apparatus cannot cope with inorganic matter. Higher forms of vegetation such as our domestic grains are like human beings in that they would starve to death if they were planted on land which had not previously been transformed into "topsoil" by countless generations of simpler forms of vegetation consuming the raw elements of earth, energy from the sun's rays and carbon dioxide from the air. Wild, primitive vegetation and its accompanying army of bacteria may seem to be a nuisance but they are not less important in preparing our meals than the grinding mills which transform our sugar cane into sugar. Alas, how little attention that fundamental fact is given. If a sugar mill closes down the local Chamber of Commerce throws a fit, but nature's factory which produces our topsoil has been closed down on millions of acres in America and no one gives it a serious second thought.

RELIEF ROLLS TELL STORY OF ABUSE OF SOIL

Abuse of the topsoil, and the water resources that enable the topsoil to produce, is one of the bedrock reasons why scientific large-scale conservation is a necessity if we are to survive and flourish as a nation. Erosion by wind and water has invaded the capital equipment of topsoil on this continent until the soil experts tell us a hundred million acres of our best soils are now no longer able to sustain life. Where did the people go when driven from this vast area? Look at our relief rolls for many of their names.

We have in this country a margin of unemployment that is not pleasant to contemplate. We have, within a scant generation, destroyed in our commercial fisheries, our forests and our marshlands,

■ Captive Common Mallard Ducks. This picture was taken at Monroe, La.

■ Eastern Bluebird feeding young. The nest is located in stump. Photo taken at Liberty Hill, La.

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*Quoted from a speech by John S. Darling, former President of the National Wildlife Association.

the means by which millions of families, now supported by public funds, could have sustained themselves had we chosen rational harvesting instead of destructive exploitation.

We murdered the forests, we ruined the fishing grounds, polluted the waterways and finished off the surviving food fish by scooping them out faster than nature could produce them. Crimes against marshlands, which are nature's sponges to hold surface water, were spectacular exhibitions of our ignorance of nature's laws. Frenzied exploitation of wildlife resources reached a climax at the turn of the century. The passenger pigeon and the buffalo were wiped out—their passing symbolic of the rapacity of mankind—and the noble forests of pine which should have yielded an annual harvest perpetually, were about finished. The scramble for the last public lands was on. Then the drainage sharks turned their eyes on the marshes, the great surface reservoirs that hoarded the spring freshets and the summer rains, balking floods and erosion, maintaining water tables—the abode of a capital stock of fur, which took up the slack in unemployment during dull months, and augmented the income of thousands of families—the breeding place not only of myriads of waterfowl, but of more than a hundred other species of bird life.

It seems rather cold and mercenary to remind ourselves that waterfowl, journeying up and down the continent, pay dividends, not only in sport and food, but in millions of dollars of currency flowing briskly through scores of channels. A billion a year, according to government figures, represents what outdoor recreation puts in circulation in this country. This money is spent for ammunition, guns, hunting equipment, clothing, boats, gasoline, oil and other essentials, providing work for many people and carrying a share of the cost of parish, state and federal governments. Hunting and fishing represent a national asset.

TERRIFIC TOLL TAKEN OF OUR NATURAL RESOURCES

But a body blow is struck at this great natural resource by the thoughtless, careless and tragic destruction of the wealth of wild life that once was ours. Within a generation we have seen the environment of our wild life, with its background of natural beauty, as well as continual inspiration, all changed. Lakes and marshes in which wildfowl nested have been drained to make more tillable land. No thought was given to a continuing supply of moisture which these lakes and marshes supplied during the summer months. Drainage of natural reservoirs of moisture has lowered the water table over a considerable portion of our land until the trees and other vegetation can no longer reach the constant supply of moisture with their roots drawing it upward and giving it off into the atmosphere through their leaves. The failure of a constant supply of moisture coupled with the thoughtless and unwise destruction of timber and brush on our hillsides has caused excessive erosion. With the protective covering made by this vegetation gone, the light humus in the soil has quickly washed away, destroying the fertility of the soil, and clogging the watercourses. With this humus gone, the other elements no longer bound by the moisture, quickly respond to the winds and dust clouds darken our skies with a black and ominous warning that should never have been necessary when history and science tell us that the conditions we are creating are just such as caused the creation of vast desert areas such as the Gobi, Sahara and those in Babylon and Syria.

All of this, with the destruction of the beauty and usefulness of our watercourses, through wasteful use of our timber and through pollution, has destroyed not only the nesting places of our water fowl, but our game and song birds, our wealth of game animals and our supply of game and food fish. With 80 per cent of our streams so polluted that animal life cannot well survive, we have taken a terrific toll of our great natural resource.

Some of this destruction can be repaired, much of it cannot. Unfortunately its effect on human life and social conditions are as appalling as the effect on natural conditions, but this age seems to be one which the grave underlying tendencies that change the whole life of our people are given little thought.

If the privileges and opportunities afforded by wildlife are to be restored and conserved to make an adequate contribution to our economic and social welfare, what is necessary to be done? There must, of course, be regulations to preserve adequate breeding stocks and the employment of land utilization programs to provide proper food and environmental conditions for wildlife just as the farmer supplies food and pasture for his domestic stock. The public in general is prone to look on wildlife somewhat as they do on coal or oil or natural gas, apparently feeling that nature is fully capable of furnishing an inexhaustible supply without any further assistance. The public officials charged with the administration of this resource are often felt to be derelict in their duty when they cannot find some magic formula to furnish a deer or bevy of quail for all who buy licenses. Few seem to realize that wildlife cannot be produced by the mere passing of laws or imposing of restrictions on hunters any more than beef and pork can be produced by requiring the consuming public to go without meat three days a week. And, as in the livestock, the farmer is in large measure the producer of wildlife.

■ Brown Thrasher's nest. This photograph was taken in Oak Grove, La.

AGRICULTURAL ESSENTIAL TO WILDLIFE DEVELOPMENT

Contrary to the opinion of many, much of our wildlife population is a by product of the farm rather than sanctuaries set aside for their specific use. Many appear to think that wild things are raised only on the vast stretches of public domain, the national forests, national parks, or other wilderness areas and that the future of wildlife conservation must depend upon the acquisition of sufficient such acreages to supply the needs. Fortunately, this is erroneous. The state and federal governments never can and never should own and control enough lands to produce the wildlife which the people of this country want and expect to have. Sanctuaries are necessary for certain specific purposes but they never can do more than provide a small part of the total requirements for wildlife production.

Wildlife is an organic resource. Wildlife is a product of the soil. Wildlife is inseparable from the land. It depends on Mother Nature for its nourishments, its protection and its very existence, and only she can produce the essential requirements. In an agricultural nation it is inevitable that the wild things must be produced in conjunction with agricultural pursuits. Game produced on the farm furnishes the great bulk of the sport for the hunters, and the management of those farm lands spells success or failure for the game which must look to the farmer for food and shelter.

Wildlife, linked with the land as it is and always must be, the dependent on the unused nooks and corners of the farms for so much of its sustenance, must look to the Department of Agriculture as its source of benefits from the hand of government. The record of this department has been one of true conservation, not exploitation, and the needs of wildlife have been met by action instead of press releases and radio talks. Agents of the Department of Agriculture charged with the administration of this resource manage it for the benefit of the people and permit reasonable use by hunters.

The state of Louisiana has acquired and set apart a total of 438,000 acres for use as wildlife preserves and sanctuaries located in seven widely separated sections of the state. In addition, the federal government and other agencies have acquired approximately 500,000 acres for the same purpose. These projects furnish a background for the protection and conservation of the wildlife population of the state, but they do not solve the problem which inherently rests with the farmers themselves, and with the public whose cooperation is essential. The bulk of sportsmen must look to the species produced on the farms for their chief source of outdoor recreation, and if tangible and adequate results are to be achieved, they must of necessity lend intelligent support to the program. The Department of Agriculture fully recognizes this fact and has integrated the needs of wildlife into the general agricultural program, through the field service of the Agricultural Adjustment Administration, the Extension Service, the Soil Conservation Service, the Forest Service and the Biological Survey. Through these agencies farmers are advised of practices which may be adopted under their program to provide more suitable food and cover for wild birds and mammals on agricultural lands. For instance, green manure crops left standing on the land, the seeding of legumes, the improvment of depleted pastures by reseeding, deferred grazing, the construction of reservoirs and dams, the planting of shrubs for windbreak protection, strip cropping, and many other practices for which farmers now receive benefit payments from the federal treasury provide cover and nesting sites, as well as additional food for quail, rabbits, and other game species, as well as song and insectivorous birds.

INTELLIGENT PUBLIC COOPERATION IS VITALLY NEEDED

Fine as this program of government sponsorship is, it is not enough to insure restoration of our wildlife resources. All the government aid in the world, all the regulatory measures made possible by law will not be sufficient to preserve the vanishing wildlife of the state and the nation, unless coupled with the program is a concerted, intelligent cooperation of the public in whose interest the program is designed. Thoughtless and selfish hunters, bereft of the qualities that constitute genuine sportsmanship, can completely set at naught the efforts which have been inaugurated. There must be a voluntary and united effort to prevent trespassing on protected lands both in season and out of season. There must be diligent precautions against starting fires in woods and brush, the natural cover for wildlife. Stray cats and dogs, hereditary foes of wildlife, must not be permitted to roam at large in projected areas. The killing of insectivorous birds by a predatory cat is an economic loss not alone to the farmer but to the people who depend on the successful growing of farm products for its food supply. These practices on the part of the public are simple, but entirely essential if our wildlife is to be brought back to its proper place in the economic structure of the state and the nation.

" . . . Wildlife and birds depend on Mother Nature for nourishment" . . . A rare picture of a chipping Sparrow taken in Bienville, La.

Through the cooperation of the Agricultural Extension and Forestry services of Louisiana, a program of game management has been undertaken in the northern sections of the state, designed to extend into all parts of Louisiana. In Lincoln parish an area covering 3,000 acres of farmlands is now a part of the protective enterprise, while the entire parish of Bienville has adopted a program through organization of its communities to the same end. A similar effort has been initiated in Union, Claiborne and Grant parishes. These projects are in the nature of demonstrations of what can and should be done by farmers in encouraging repatriation of wildlife on the farms of Louisiana. Allied with this effort is an educational program through the 4-H clubs of the parishes, enlisting boys and girls in a study of the importance of birds and mammals in the economic life of the state. It may be that we will have to wait until these boys and girls grow to maturity before our citizenry comes to a full appreciation of the necessity for conserving our wildlife resources, but if so it will be because their elders have failed to properly estimate their own responsibilities in handing on to their children a priceless heritage. If that heritage has been dissipated so that there is none to pass on to the future generation, everlasting opprobrium must be the portion of those who have misused and misspent it. The natural resources of a nation are not designed just for the uses of today. They belong also to the generations of tomorrow. Dissipation of the inheritance that once was so liberally ours is one of the crimes that we have committed against posterity. Sooner or later we must develop a national conservation program if this nation is to survive. We have traveled a long way down the trail marked despoliation, and if we ignore the signals that are apparent today we must come to the point where we will have to decide whether our land becomes a barren waste, occupied only by structures of brick or steel and stone, or a land in which clean waters flow, in which trees abound, and in which such ancient and honorable diversions as hunting and fishing shall not be included among the lost arts.

EXEMPT FROM LICENSES

The last session of the Legislature enacted a law that exempts people the age of 60 and over from purchasing a state hunting or fishing license. They can obtain a permit from their sheriff's office in lieu of a license, but they are required to carry the permit with them while hunting or fishing.

The hunting permit, however, does not exempt those 60 years of age and over, from the purchase of a Federal duck stamp if they hunt ducks or other migratory birds. The Federal duck stamps must still be purchased and attached to the permit. For the hunting of other than migratory birds, no duck stamp is necessary.

Vasso M. Tainer, Professor Zoology, Brigham Young University, Provo, Utah.

"I think the Review is one of the most valuable publications on conservation published in our country."

Organize Wildlife Federation to Push Conservation

[Continued from Page 8]

important periods in the history of conservation in Louisiana, that this is the eve of a new era. Assembled here are top executives of the U. S. Fish and Wildlife Service, conservation commissioners and others high in the wildlife councils of three neighboring states, representative sportsmen from all portions of Louisiana, trappers, shrimpers, oystermen and members of the Department of Conservation—all with but one motive—the restoration and the conservation of wildlife in our State.

"The encouragement and enthusiasm of this conference will have a marked effect upon the confidence of your Conservation Department. We feel very definitely the need of your experience and your cooperation. The active support of the thousands of organized sportsmen will insure the early success of our program, which is to make this State second to none as a wildlife paradise.

"Our wildlife program is not yet complete, and cannot be definitely planned until we are certain of our authority. However, certain definite plans are now under way. A legislative appropriation of $25,000 will make available a W.P.A. grant of approximately $75,000. Before wildlife porjects are undertaken, a great deal of careful study and research must be completed. We do not intend to spend your money on a hit or miss basis. An experimental W.P.A. gar control program is being worked out. If this is successful, it is hoped that operations may be of a more general nature. Enlargement of quail and fish hatcheries with W.P.A. funds is contemplated. Some small experiments have indicated that the recovery of fish by seining the barrow pits along the Mississippi, Red and Atchafalaya rivers may be more practical and less expensive than the raising of fish in hatcheries. The Department is now conducting such seining operations under the direction of one of its biologists. If this method of restocking our streams is found practical, it is contemplated that the projects will be enlarged and increased with W.P.A. funds. Our quail hatcheries will very definitely be enlarged, either through W.P.A. or our own efforts. Our hatcheries are now provided with more than an adequate supply of brooding stock. It is our intention to hold until spring the birds which will be available for release. But before they are released we must be assured that adequate food, shelter, cover and protection will be available.

"You all know, of course, that we have for the first time qualified under the Pittman-Robertson Act. With State and Federal money available under this Act, we shall have $40,000 to spend upon approved projects which we hope will soon be under way. At this time our plans include several quail projects, some in conjunction with the Soil Conservation Service; a muskrat project, which contemplates a study, on the grounds and in the marshes, of the relationship of muskrats to other wildlife on our preserves and the proper amount of trapping. We hope also to provide at least one wild turkey and one deer project.

"The restoration and conservation of wildlife is a slow, technical and long-time undertaking. I assure you that we, in the Conservation Department, will be in there pitching, giving the best there is in us. We ask your support, your indulgence if needed, and your patience when necessary."

Other speakers at the convention included W. F. Dearman, Mississippi Conservation Commissioner, Walter Gresch of Atlanta, Ga., regional inspector for the United States fish and wildlife service, D. N. Graves, Commissioner of the Game and Fish Commission of Arkansas, and J. Paul Miller of Washington, secretary of the American Wild Life Institute.

FEDERATION PLATFORM

The platform of the Louisiana Wildlife Federation, pointing out its aims and purposes is as follows:

Organization: This organization is a non-political, non-profit group of Civic minded men and women interested in the basic principles which underlie constructive Conservation. A few of them are as follows:

1. Administration by a competent and trained personnel.
2. Hunting and Fishing licenses spent only by the Conservation Department.
3. Commercial fishermen, trappers and land owners work under practical Conservation laws and be given protection of their property.
4. The Conservation laws be enforced by a trained full time force of agents.
5. That the natural habitat of fish and game be protected and improved and that a sufficient supply of game and fish always be left in our lakes, streams, fields, and forests so that nature can carry on its natural propagation.

Our Conservation Department is now working to accomplish the above and more, let us express our appreciation by giving them our support whenever they need or ask for same.

Legislation: The only laws we are interested in as an organization are those that directly affect the fish and wildlife of our state. We hold that the only way by which we may obtain a voice in the framing of such laws and regulations is by forming a statewide federation of individuals and associations who are interested in Conservation. We will ascertain the concensus of opinion in our state on seasons, bag limits and other matters and will present same to the United States Congress and the Louisiana Legislature and all other departments and officials concerned in order that our views may be properly considered.

Conservation: We believe that local Conservation Clubs can accomplish a great deal in their communities by practicing ethical hunting and fishing and requesting their members and local officials to respect and enforce the law. We do not think these organizations working independently can secure good Conservation for the state as a whole nor that they are strong enough in our Legislature to repeal or enact Conservation laws but by a federation of all the local organizations into one big statewide organization we can accomplish much if the time should ever come when such a move is necessary. We will collect data by exchanging information between our various local chapters on wildlife and its depletion, fish and game propagation, food and cover and restocking, forest and brush fire hazards and will pass this information on to the United States Fish & Wildlife Service and the Louisiana Conservation Department. We shall always strive to increase the supply of fish and wildlife so we can keep our present bag limits or increase them. We urge our members to talk good, clean sportsmanship and to assist in all educational moves of this nature.

Law Enforcement: We insist on the purchase of licenses by our members and the observation of laws. We will use every effort to insure the adequate administration of justice and to decrease violations of fish, game and Conservation laws.

Sportsmanship: We insist on the ethical practice of hunting and fishing. We promote good will between sportsmen and between sportsmen and commercial fishermen, trappers, farmers and land owners.

W. Storrs Cole, Ohio State University, Columbus, Ohio.

"The Review is excellent. We often post certain of your articles on our departmental bulletin board."

Dr. H. Rice, Cornell University, Ithaca, N. Y.

"I regard the Review as an excellent publication, valuable in information on conservation and geology."

State Police Join With Conservation Agents In Law Enforcement

[Continued from Page 5]

District Number 1:—Robert D. Landry, Paradis, Supervisor. Parishes in this district are Assumption, Jefferson, Lafourche, Plaquemines, St. Bernard, St. Charles, Terrebonne, and part of St. John.

District Number 2:—Loys H. Blanchard, Baton Rouge, Supervisor. Parishes are Ascension, East Baton Rouge, East Feliciana, Livingston, St. Helena, St. James, part of St. John, St. Tammany, Tangipahoa, Washington and West Feliciana.

District Number 3:—Robert Prather, Jennings, Supervisor. Parishes include Acadia, Allen, Beauregard, Calcasieu, Cameron, Jeff Davis, Lafayette, Vermilion and Vernon.

District Number 4:—J. V. McConnell, Shreveport, Supervisor. Parishes include Bienville, Bossier, Caddo, Claiborne, DeSoto, Jackson, Lincoln, Natchitoches, Red River, Sabine, Webster and Winn.

District Number 5:—R. S. Milliken, Oak Grove, Supervisor. Parishes include Caldwell, Catahoula, Concordia, East Carroll, Franklin, LaSalle, Madison, Morehouse, Ouachita, Richland, Tensas, Union and West Carroll.

District Number 6:—A. B. Burns, Pineville, Supervisor. Parishes include Avoyelles, Evangeline, Grant, Iberia, Iberville, Pointe Coupee, Rapides, St. Landry, St. Martin, St. Mary and West Baton Rouge.

The six State Rangers are J. W. Bates, Akers, Julius Book, Slidell, Ben Dahler, New Orleans, Lodger Duet, Cut Off, D. L. Farrar, Shreveport, J. W. Wolfley, New Orleans.

To do away with the practice reported to have been popular in the past of transferring licenses, an important change has been made this year in the hunting licenses. In addition to the usual questions of name, address and age, persons applying for hunting licenses now are required to give a description of themselves. This information, including the weight, height and color of hair of the party to whom the license is issued, is shown on the certificate which the hunter must carry in his possession while in the field.

While no figures are available at this time, it is believed that the sale of fishing and hunting licenses this year will exceed those of any previous year, due to the rigid enforcement policy of the Conservation Department. Persons who have been caught hunting or fishing without a license have had their guns and fishing equipment confiscated, and these have been returned to them when they have purchased the license.

Commenting on the plan of cooperation between the State Police and the Conservation Department, Superintendent Alford of the State Police stated that he "was glad of the opportunity to help prevent the waste of our game and other natural resources."

"The natural resources of the state belong to all the people of the state and the legislature has seen fit to pass laws protecting them. Violation of these conservation laws is just as much an act of law breaking as violation of any other statute."

THE RECORD TELLS THE STORY

ARRESTS, CONVICTIONS AND ACQUTTALS—ENFORCEMENT DIVISION, DEPARTMENT OF CONSERVATION

FROM JUNE 1, 1940 THROUGH NOV. 12, 1940

Parish	Total Arrests	Convictions	Acquittals	Cases pending
Acadia	4	0	0	4
Allen	0	0	0	0
Ascension	4	0	0	4
Assumption	0	0	0	0
Avoyelles	20	0	0	20
Beauregard	0	0	0	0
Bienville	0	0	0	0
Bossier	0	0	0	0
Caddo	2	1	0	1
Calcasieu	19	4	2	13
Caldwell	0	0	0	0
Cameron	5	2	0	3
Catahoula	6	4	0	2
Claiborne	3	0	0	3
Concordia	18	7	0	11
DeSoto	0	0	0	0
E. Baton Rouge	4	0	0	4
East Carroll	7	2	0	5
East Feliciana	10	0	0	10
Evangeline	6	0	0	6
Franklin	9	1	0	8
Grant	6	0	0	6
Iberia	11	0	0	11
Iberville	10	0	0	10
Jackson	1	1	0	0
Jefferson	53	3	7	43
Jeff Davis	5	2	0	3
Lafayette	18	0	0	18
Lafourche	32	0	0	32
LaSalle	11	2	2	7
Lincoln	2	1	0	1
Livingston	5	0	0	5
Madison	22	14	0	8
Morehouse	7	0	0	7
Natchitoches	12	0	0	12
Orleans	6	0	0	6
Ouachita	9	0	0	9
Plaquemines	5	0	0	5
Pointe Coupee	5	2	0	3
Rapides	10	4	0	6
Red River	6	0	0	6
Richland	4	0	0	4
Sabine	2	0	0	2
St. Bernard	9	0	0	9
St. Charles	14	7	1	6
St. Helena	0	0	0	0
St. James	10	3	0	7
St. John	7	0	0	7
St. Landry	11	1	0	10
St. Martin	14	1	0	13
St. Mary	3	0	3	0
St. Tammany	11	0	0	11
Tangipahoa	31	11	3	17
Tensas	12	8	0	4
Terrebonne	7	0	0	7
Union	10	1	0	9
Vermilion	5	0	0	5
Vernon	4	0	0	4
Washington	0	0	0	0
Webster	2	0	0	2
W. Baton Rouge	0	0	0	0
West Carroll	6	0	0	6
West Feliciana	1	0	0	1
Winn	2	0	0	2
Totals	518	82	18	418

■ **Aerial view of the U. S. Fisheries Biological Station at Pensacola, Fla., showing residence buildings, laboratory, storeroom and warehouse, dormitory, boat-slip and boat house. Louisiana is the first of the Gulf States to make use of the facilities of this station, where experimental work on the Japanese oyster is now under way.**

(Photo by Dallin Aerial Surveys, Philadelphia)

"Mud blisters" on the inner surfaces of the shells of Japanese oysters imported for experimental purposes to Louisiana and found in incredible numbers in each of these individuals without exception have stimulated work to determine why these oysters—and **not** Louisiana oysters under similar conditions of life—should be so affected.

Mud blisters, as many oystermen and oyster consumers know, are infrequently found in small numbers even in the native Eastern oyster (the Louisiana oyster as Louisianians know it)—**Ostrea virginica.** The blisters are seen to be composed of two separate regions—a rounded region located rather centrally and a narrower, more constricted region extending from the rounded area to the rim of the shell; they may be likened in shape to the profile of a bottle or a pear with the rounded area of the blister corresponding to the similar expanded portion of a bottle or a pear, and the narrower region of the blister corresponding to the neck of the bottle or the stem of the pear. They are **not** by any means the sign of a poor oyster, for the best, healthiest and "fattest" oyster may show one, two or even more mud-blisters. The blisters represent pests which have entered the oyster's home (the space within the two valves or halves of shell) and have been sealed out of that home by the oyster depositing a layer of shell over them. The pests in these blisters, whether live or dead, are actually **outside** the oyster's home, exert **no** poisonous effect upon the oyster, do **not** make the meat in any way unfit for consumption, and are to be regarded **not** as oyster parasites, but as oyster **pests.** More light on the term pest will appear later.

The oysters in which the blisters appeared in inordinate and unhealthy numbers were some sixty individuals imported from Willapa Bay, Washington. They had been brought to Willapa Bay as "seed" oysters from Japan and are not of the same species as the native oyster of Louisiana; they are **Ostrea gigas,** native to Japanese coastal waters. It is the same oyster whose introduction to the waters of the Gulf of Mexico was proposed by many who were impressed by the success the oystermen of the Pacific Coast are enjoying through its cultivation.

There was good reason for the suggestion, for the success of the Japanese oyster on the West Coast could be spoken of as nearly phenomenal. Any oyster industry whose output in 13 years (1922-1935) can increase two thousand times, and which can grow from nearly nothing to an organization supplying approximately one-fourth of the canned oysters of the United States, is a million-dollar seafood industry of the first class. And there was good reason for the success of the West Coast industry: the Japanese oyster (or "Pacific" oyster as it

MUD BLISTERS IN JAPANESE OYSTERS IMPORTED TO LOUISIANA

by

L. D. KAVANAGH *

has come to be called) is large, with rapid-growth characteristics which make for quick turnover of investment, thin-shelled, making for good yield in oyster meat, and possessed of canning qualities not found even in our native oyster; in the can the large Japanese oyster suffers less shrinkage, loses less of its glycogen or animal starch, and has the color of "rich, pure cream," as its advertisers are quick to say.

FLAVOR AND QUALITY OF LOUISIANA OYSTER WELL KNOWN

There were many factors, however, practical and biological, which made its introduction to these waters highly inadvisable. From a practical standpoint, it is known that no oyster but the Louisiana oyster has the particular flavor and quality of meat which Louisianians have come to know and demand; none but such an oyster would the canneries risk their reputation on packing. From a biological point of view, it is known that there are, associated with the introduction of any new animals into a smooth-functioning biological system, many dangers and uncertainties which must be given serious and deliberate consideration. It would be little short of foolhardy to risk the probable introduction of new oyster pests with new animals, to risk a food-shortage for old and new stock by disturbing the equilibrium of nature's food-cycles. It would be unsound judgment optimistically to ignore the uncertainties as to the qualities of the new animals in a new home, to expect without proof that the new animals would be able even to survive and withstand the pests and the vicissitudes of their new environment.

For these and many other sound reasons the introduction of Japanese oysters to the waters of Louisiana was discouraged. It was decided, however, to attempt to produce a new oyster, a hybrid bred of American and Japanese stock. The production of such an animal is being tried in an effort to acquire an oyster with desirable characteristics of both species (rapid growth, thin shell, large size, good canning qualities and prime flavor and texture). Such an animal—laboratory produced—would be obviously free of new pests. There are, of course, many points which must be investigated: the possibility of practical mass-production of hybrids, their growth characteristics and canning qualities, their effect upon the native stock, their ability to live, grow well and withstand our native pests.

It is not the purpose of this paper to present a report on the actual experimental work; no further word can at present be added to the "Preliminary Report on an Experiment in Oyster Hybridization," released in the Winter, 1939, issue of the Louisiana Conservation Review. Mention is here given of several interesting findings on the shell-pest causing the mud blisters mentioned earlier.

In a general way, it can be stated that previous experience with Pacific oysters in Gulf Coast waters has been disappointing. Several cases of oysters planted in Mobile Bay and later transferred to certain shelters in the Louisiana marsh showed exactly 100% mortality. On a second trial, several cases of seed oysters (small oysters not more than half an inch in size) showed the same complete mortality; two cases of mature oysters imported at this time showed these results: 40% failed to survive for reasons unknown, 40% perished on prolonged exposure to summer sun in an unusual and prolonged fall in tide, 20% were used for laboratory experimentation. In all cases, the oysters showed a gradual decrease in general good health and vitality before death or destruction. In the case of those oysters which failed to survive for reasons unknown, the explanation may be that these oysters were in warm water (73° to 77°F.), water which was almost fresh, with less than one-fifth the salt-content of pure sea-water, or water significantly fresher than that to which the oysters had been accustomed. It should be remembered that the Pacific oyster in its real native environment grows best in the cold, distinctly salty water of the coast-line of northern Japan but grows poorly in the warmer waters of southern Japan. The third lot of oysters imported—somewhat less than half a bushel—were received from Japan in the usual manner as seed oysters and cultured to large size (four to seven inches) in Willapa Bay, Pacific County, Washington. Willapa Bay, it may be mentioned in passing, is an excellent site for oyster culture, one of the most successful on the West Coast.

EXPERIMENTS ON JAPANESE OYSTERS DESCRIBED

On arrival in Louisiana, these oysters were in good condition: the shells were in good shape, the body mass was solid and very firm with a thick, well-developed sex-cell-producing layer on either side, the muscle tonus was evidently strong, the water-pumping activity was normal. They were placed in four aquarium tanks into which there was a continuous flow of water from a 500 gallon cistern. The water in the cistern (which was pumped up from Grand Pass) gave to these oysters—for all practical purposes—the same environmental conditions as native oysters growing normally in Grand Pass. Therefore, the set-up was ideal for a controlled experiment, with the Pacific oysters in the aquaria and the Louisiana oysters in the bay, both species using the same water, and consequently living under relatively similar conditions.

For four weeks, the Japanese (Pacific) oysters lived normally and seemed to have acclimated themselves to their new environment. Within the next month, however, many became weak, several died, and all showed many mud blisters on their inside shell surfaces. Analysis of the meats of two of the survivors

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* Biologist, Division of Oysters and Water Bottoms.

(typical of the group) showed definitely in what poor condition these oysters were. In comparison with meat analyses of oysters received in good condition some time back from Gray's Harbor (a bay adjacent to Willapa where oyster conditions are for all practical purposes the same as those of Willapa), the affected oysters showed a drop in meat content of 88.55%; that is to say, accepting as standard (or roughly so) the oysters from Gray's Harbor (which represent the average or usual Pacific oysters) the oysters which grew poorer in Louisiana possessed only 11.45% of the meat Pacific oysters normally have. In view of the fact that this was a drop in **meat** content, not a mere process of dehydration or water-loss, it is almost inconceivable that any animal could suffer such a loss and yet live—as some of the oysters did. A comparable loss in man is so utterly impossible that one finds it hard even to imagine a man who normally weighs 136 lbs. losing 121 lbs. and weighing 15 lbs.

On examination, there were two striking points to be noted in these Japanese oysters imported to Louisiana waters: the meats were poor and the shells were blistered. Now no one could afford to state positively that one exact condition in the environment caused these oysters to grow poorer; the decline could have been caused by many things. It is not at all improbable, however, that at least one of the main reasons that the oysters were so poor was that a large part of their energies was being devoted to shell production as a matter of self-preservation. To explain:

OYSTER SHELL SERVES OTHER PURPOSES THAN PROTECTION

The shell of an oyster serves many functions, an obvious one of which is the providing of a protecting home for the animal. When pumping water for feeding, respiratory or spawning purposes, for instance, though the oyster has its shell either periodically or rather continuously open, the shell is nevertheless at least a potential protection. For, when an unusual chemical or physical stimulation of any receptor organ, especially the mantle edge, presages danger to the soft inner parts, contraction of the adductor muscle or "eye" of the oyster causes closure of the shell with the effecting of a complete armor about the animal. Rapid fall or rise in heat level at certain temperatures, unfavorable salt, acid, or base concentrations, and certain shadows cause closure. Again, when a bit of foreign matter or a foreign organism enters the shell cavity, the animal is frequently able to "blow out" the invading material by snapping the shells shut at least part way; in this manner, pressure caused by the reduction in volume of the shell cavity and currents produced within the mantle chamber expell the offending substance. For a clear understanding of this point one must consider the structure of the oyster. Inside its shell cavity and closely adherent to either shell is the outermost layer of tissue of the soft body of the oyster—the mantle—one to a side. Sheathed between the two mantles is the mantle chamber, containing all the inner parts of the animal. The mantle serves many functions. It secretes the shell, acts as an accessory organ of respiration, as a sensory organ and, in addition, provides space for currents of water within its chamber. These currents are formed by the action of cilia or small beating hair-like structures on the gills within the chamber, bringing food, oxygen, etc., to the animal and carrying off the unassimilated food, etc. Irritating materials consequently, can be ordinarily flushed out of the mantle chamber. Between the mantle's outer surface and the inner shell surface, however, there is another at least potential space, since the mantle, though usually closely adherent to the shell, is not structurally affixed to it. A foreign particle in that space can be dislodged only by the oyster withdrawing its mantle and allowing water to go up into the space between shell and mantle and then squirting that water out by quick closure of the shell. With quick closure of the shell and consequent decrease of the space in question, pressure is built up and the water ejected, carrying with it the unwanted material.

Editor's Note—This article is one of the reports of the biologist of the Oyster Division to Mr. J. N. McConnell, Director of the Division. The experimental work on the Japanese oyster and related matters has been transferred for the time from the field laboratory of the Department at Grand Pass, La., to the new marine biological station of the United States Fish and Wildlife Service at Pensacola, Fla.

This station has been established by the Federal Government primarily for research in production and conservation problems in the sea-food industry, especially the oyster industry. Louisiana is appreciative of the value of this splendid station and is proud to be the first of the Gulf Coast states to accept this offer of the Federal Government by actively making use of the facilities of the station. Dr. A. E. Hopkins, internationally acknowledged authority in oyster research, is director of the station.

In some few cases, this mechanism seems inefficient, and at times the oyster cannot dislodge the irritating material. This, for instance, happens when an irritating agent of some type lodges in the space between mantle and shell, and the only manner in which the oyster can rid itself of the irritation offered by such an agent is through the secretion of a shell-like cover for it. In this manner pearls are sometimes formed. Into this space also, members of the zoological groups Platyhelminthes or Annelida may wander to take up residence on the inner surface of the shell. **Stylochus inimicus** (a platyhelminth) has caused wide-spread oyster destruction at Apalachicola, Fla. by using that location as a point of vantage to attack the oyster meat. Less inclined to such depredations the annelid pests enter simply to use that location as a home. In order to wall out the pests of the type of **Stylochus,** which will actually feed on its flesh, or to maintain the private use of its own shell cavity, the oyster secretes a new layer of shell over the intruder. With the deposition of this layer of shell, a blister on the inner surface of the shell is formed, within which is the pest. Infrequently the blister completely encloses the invader, which is, in such a case, shut off from the water which brings its food and provides necessary chemical exchanges of respiration; the animal, therefore, dies and disintegrates within the blister. This is the usual defense mechanism (too often ineffective) which oysters in Apalachicola, Fla. have used for combatting **Stylochus.** In the case of the annelids, the usual observation is that the pest places itself in such a manner that, as the blister is being formed, entrance-ways at the rim or edge of the valve are maintained. There is thus formed a shell-blister on the inner surface of the oyster shell or valve. The major part of this blister takes the shape of the rounded portion of a pear or of a bottle. Extending from this rounded portion is the narrow channel or tube leading to the rim of the shell like the neck of the bottle or the stem of the pear.

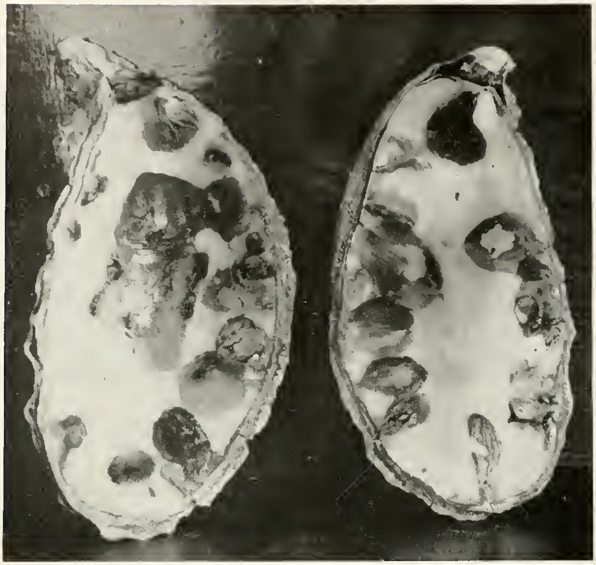
Now in the particular cases under discussion, the mud-blisters are of a type caused by an annelid polychaet, believed to be **Polydora ciliata,** the animal G. Robert Lunz, Jr. of the Charleston, South Carolina Museum discussed in **Science,** October 4, 1940, Vol. 92, No. 2388, p. 310. In this article, he stated:

> ". . . a study is being made of one of the numerous pests to which the commercial oyster, **Ostrea virginica,** of the Atlantic Seaboard, is subject . . . This particular pest is a small annelid which causes a "mud blister" in the oyster . . . Within the blister one finds the annelid,

> which has access to the outside through two tunnels opening along the edge of the shell. The . . . [animal] . . . has been identified by Dr. Olga Hartman as **Polydora ciliata** (Johnston.) Although **Polydora** is well known, its occurrence in such abundance as to become an oyster pest seems as yet unreported in the United States . . . [It] . . . upsets the normal life of the oyster by restricting its living space and generally weakening it . . . Indications are that . . . [the animals] . . . were prevalent in South Carolina even in pre-colonial days."

Two of the infested valves from the group here considered were sent to Lunz for possible confirmation of the identification of the organism causing the blisters. His reply, given in part, follows:

> "The shell mentioned in yours of the 17th came this morning. . . . I certainly am glad to have the opportunity of seeing this specimen. I don't believe that I have ever seen an oyster so badly infested as this one. With two exceptions all the blisters are typical of the kind from which I have secured **Polydora.** The first exception is the large central blister with no apparent connection with the outside edge of the shell. That may well have been caused by **Polydora,** but I don't know positively. . . ."



■ **Shell of Japanese oyster imported to Louisiana, showing mud blisters on inner surfaces, especially conspicuous near the rims. The inner surface of the shell of this oyster is well known to be normally almost milk-white.**

Many pests were taken from blisters like those Lunz speaks of, and the typical ones are tentatively identified as **Polydora,** the identification being based on the facts that the conspicuous frontal ridge, the large pair of tentacles, the enlarged fifth segment and the prominent gills from the seventh segment back are distinctive features of **Polydora.**

The annelid is readily taken as food by crabs, fish and similar larger inhabitants of the sea, since its rather soft body is entirely unprotected from these predators. Unable to defend itself, its instincts lead it to seek shelter in places inaccessible to its enemies. One of these ideal places is within the shell cavity of the oyster, into which it often creeps. And, unless the oyster is able to "blow it out," here it remains, sheltering itself but irritating the oyster. To rid itself of the irritation, the oyster seals the pest out of its chamber by the deposition of shell over it, and the shell deposited forms the blister. The animal,

■ **"Louisiana's" corner of the U. S. Fisheries Biological Station. Worthy of note are the large and comfortable desk-tables, equipped with electricity and gas outlets, the abundance of light, the research tables with their running sea-water.**

it can be reiterated, apparently never penetrates the meat and is quickly sealed away from the oyster entirely, and exerts, therefore, **no** primary toxic effect; it hurts the oyster only in forcing it to work to produce shell to wall it out. To demonstrate that the animal studied particularly here, **Polydora**, is not a parasite but merely a pest, one could point out that even though anatomically rather similar to **Nereis**, **Polydora** is placed in a different group in animal classification mainly because it feeds on plant-life whereas **Nereis** feeds mainly on animal-life. The organisms eaten are, of course, microscopic.

Mud-blisters are found in Louisiana oysters, but they have never been found in significantly great numbers. In the Japanese oysters imported here, however, they were found in extremely high numbers, and it is not improbable that the terribly poor condition of the meats of these oysters can be correlated with the tremendous amount of shell secretion necessary for the formation of the blisters. Obviously, if much of the energy of an oyster is bent to shell secretion, the meat will suffer, so much so that it is not at all impossible that the oyster will never fully recover normal strength and good health. As a matter of fact, from observations to date, such would seem to be the case, in view of the fact that oysters whose shells became infested showed no sign of return to normal vitality and health even after five months.

STRIKING DIFFERENCES ARE FOUND IN THE OYSTERS

The question immediately arises: why should Japanese and not Louisiana oysters growing under similar conditions be heavily infested with this pest? And here again explanations must deal in probabilities.

If an oyster can "blow out" a pest, it need not seal it out. To "blow out" a pest, however, requires a quick, forceful application of increased internal pressure. There is little doubt that the Japanese oyster can create a great internal pressure. Unless properly applied, however, this pressure may be inefficient. Now it is often and easily seen that the Japanese oyster is rather sluggish in fully closing its shell in reaction to certain stimuli. For instance, in handling in the laboratory the two species (Japanese and American), the difference in shell-closure in the Japanese and American oyster is quite striking. The slightest movement or jar will cause the American oyster to close its shell with almost the violence of a hard-slammed door. On the other hand, one can readily pick up a Japanese oyster (open in the water) and remove it from the water with the shell still open, spilling out much of the shell-liquor in the process. As a matter of fact, to prevent this spilling, one usually presses together with determined force the valves of a Japanese oyster before moving one from tank to tank. If any of the shell liquor is spilled out, its place is taken by air, and when the animal is replaced in the water, it may be unable to expel the bubble of air, which then acts as another irritant to the animal.

Considering the slowness in shell-closure of the Japanese oyster and the still more marked sluggishness in **complete** shell-closure, it may be seen that internal pressure cannot be applied with the efficiency with which it can be applied in the American oyster, where closure is immediate, forceful and complete. It is the difference between a door slowly closed and one slammed—the "breeze" from the first has not the sharpness of that from the second, though the same amount of air may be displaced in both cases.

It is believed that the ability quickly, completely and forcefully to snap shut its shell has kept the native oyster relatively free from the annelid pests such as **Polydora** or **Nereis,** while it is not at all improbable that the sluggishness of the Japanese oyster in shell-closure has allowed infestation with these shell pests.

The phenomenon of greater susceptibility on the part of the Japanese oyster to infestation by these pests is interesting as well as important. It is interesting because it demonstrates again that in introducing an animal into a new home, much can happen. The American Indians, for example, were never afflicted with tuberculosis before the coming of the white man to his land. The phenomenon is important because it represents another factor making the introduction of Japanese oysters to Gulf waters inadvisable; not only would there be danger to the native oyster from new pests introduced by the new animals, but the new animals themselves, if so weakened by the shell-pests, would be worthless and a profitless nuisance.

Several conclusions can be reached: It is a sensible procedure to seek a new, superior oyster for canning purposes, from which an increased measure of success can be expected—at the very least equal to the success of the Japanese oysters of the West Coast. The Pacific oyster itself, however, does not represent the solution of this problem for Louisiana, for a number of reasons, one of which was discussed here: the poor defense against the annelid pests which this oyster seems to possess. The reason for this poor defense probably rests in its sluggishness of shell-closure. The only possible source of new, superior oysters—and this source has not been proved or demonstrated—is hybrids bred of local and Japanese stock; the possibilities of such hybrids are being studied.

GEOPHYSICAL ADVANCEMENT VS. THE SEISMOGRAPH

By Al Thomason

Recent progress in Geophysical exploration methods has been confined largely to advancements in practices inaugurated prior to 1938. Changes, improvements and additions have been prominent in the equipment field, while more accurate interpretations of data has resulted in several important oil discoveries in districts and areas that had been previously worked with Geophysics.

In the seismograph field a number of important improvements have been made, though more or less of a routine character of instrumental development. Several areas have become workable through intelligent application of this device.

In spite of this, the most outstanding improvement probably lies in the proper appreciation of the Geologic problem at hand and selection of proper technique. In the heavily worked areas the Geophysical problem now is chiefly to map out the low dips and depths to solve fault problems.

Application of the reflection seismograph has been broadened gradually to meet existing conditions in new districts, as well as to give satisfactory results at greater depths in the older and intensely worked areas. Good reflections are being obtained from depths out of reach of the drill, a reverse limitation from that shown by the old refraction seismograph and even the early models of the reflection instrument.

Excellent reflections have been obtained from below 15,000 feet in the Louisiana area especially along the Gulf Coast, a depth now regarded greater than that necessary for development of satisfactory reserves.

Advancement in the seismograph has not been without its serious problems. The search for oil bearing structures below 12,000 feet require highly refined instruments and exact methods of interpretation. In recording the deeper reflected waves it is necessary to use instruments that are 10 to 30 times as sensitive as those used a few years ago in mapping shallow structures. Ground unrest is amplified along with the reflections, and obviously increased sensitivity alone is not the solution, except where the ratio of ground noise to the amplitude of the reflected wave can be reduced.

Mrs. E. K. de'Lallier, San Antonio, Tex.

"I think the Review is a beautifully gotten up magazine and find the photographs especially beautiful and instructive. I find the articles interesting and educational and always pass it on to others who are also interested in reading its worthwhile and instructive articles."

■ **Artillery Range with 32nd Division of Michigan and Wisconsin National Guardsmen at camp near Alexandria.**

Louisiana's National Resources and National Defense

by
Isaac D. Chapman

(Photos by Frank W. Buckley. Cuts courtesy Alexandria Town Talk)

Because the Great State of Louisiana early recognized its importance, duties and responsibilities in the national preparedness program, the land of Evangeline and Lafitte has already obtained more than its share of the billions of dollars that the Federal Government has made available for national defense, and the State is in an excellent position to obtain more benefits as the national defense program increases in intensity.

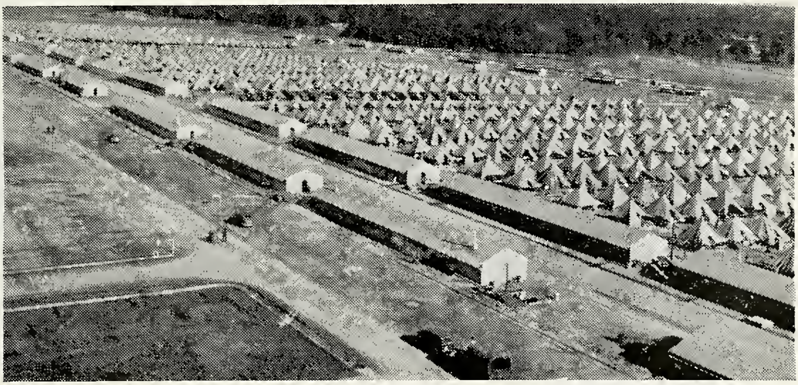
Louisiana's natural resources, advantages and opportunities puts the State in an enviable position in the National Defense Program. Not many states could place at the disposal of the nation tracts of hundreds of thousands of acres of terrain ideally suited to the year-round training of troops. Not many communities have available the required supplies of labor and materials, the transportation facilities to bring them in quickly and inexpensively, the thousand and one other elements that military officials require for speed and efficiency in promoting the nation's rearmament.

Louisiana had something to offer the nation, and it was logical that the services and facilities be utilized.

According to latest available figures, on the basis of funds already earmarked and of national defense projects already approved or scheduled to be approved, Louisiana is assured of a $300,000,000 share of the 15 billions to be expended by the federal government for rearmament, and in this respect, it is reported that Louisiana tops all the states in the total of funds allotted or to be allotted out of present appropriations.

The City of Alexandria, in the heart of Louisiana, is the center of national defense activity in the state. In the area around Alexandria large cantonments are under construction at Camp Beauregard, Camp Livingston and Camp Evangeline to house over 100,000 troops which have already been assigned to the state. Other

■ **A scene at Camp Beauregard where cantonments have been constructed for many thousands of soldiers.**



military projects include air bases at New Orleans, Baton Rouge and Shreveport, the Coast Guard base and the large military hospital on the lakefront in New Orleans, the air mechanics training plant at Delgado school in New Orleans and numerous smaller projects.

Conservation of our natural resources is an important factor in national defense, because national security lies in the conservation and utilization of our natural resources. As war clouds hover over most of the world today, it is well that the importance of conservation be given serious attention.

Natural resources may be grouped into two classes. The first may be classed as nonrestorable, such as iron, coal, other products of mines, oil and gas. The second or restorable group consists of the products of the soil, directly or indirectly.

Forestry, minerals and all phases of wildlife are all an integral part of Conservation. We must not think only of our pet resource by itself. The legs of a man cannot function without the rest of his body and so with Conservation. Land, water and vegetation are just that dependent on each other. Without these primary elements in natural balance, we can have neither fish nor game, wildflowers or trees. We must first find the ailments of our land, water and vegetation, then attempt to remedy the lack of fish and game. Unfortunately, most people miss the real significance of Conservation and think it has something to do with "Ferdinand, the Bull, smelling flowers" . . . and do not realize its economic importance.

Boiled down to the fundamental truth, the history of civilization, since man was created, is largely made up of the rise and fall of empires through the exhaustion of resources, and that is why that conservation of our natural resources is so vitally important and is receiving more recognition here in Louisiana as well as throughout the nation.

■ Camp Livingston, which will be the new home of the 32nd Division, is located on Beaver Creek, ten miles north of Alexandria. The above scene shows construction just getting under way there.

Louisiana's industrial output and raw products are in great demand for defense preparations and the State has them in abundance. Louisiana annually produces 100,000,000 barrels of crude oil, 350,000,000,000 cubic feet of gas, 1,000,000 tons of salt, 400,000 tons of sulphur, and more than 1,000,000,000 feet of lumber.

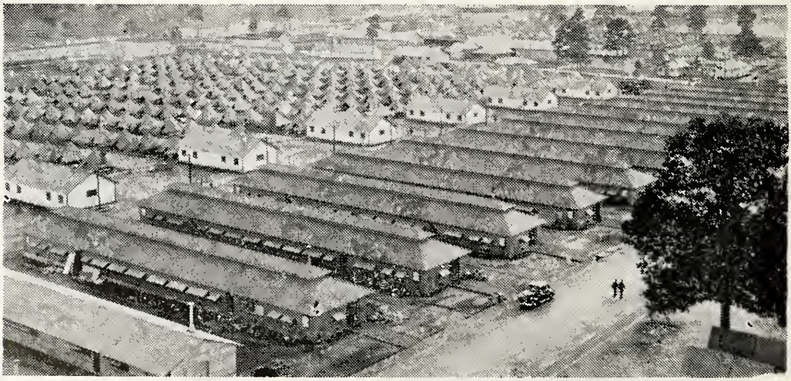
Refineries in Louisiana turn out a sizeable portion of the nation's supply of gasoline and lubricating oils.

Two-thirds of all the gasoline used in automibiles and airplanes in the United States and Canada is treated with fluid prepared in the $20,000,000 Ethyl Gasoline plant adjoining Standard's refinery in the Baton Rouge industrial section, where chemical works produce enormous amounts of acids and lyes.

Standard is building a new $1,000,000 synthetic rubber manufacturing plant. Other processing plants in the state make Louisiana a leading industrial center.

Practically every soil adapted to agriculture is found in Louisiana and the state's agricultural income from its diversified crops exceed $100,000,000 a year. It furnishes almost the entire United States domestic supply of cane sugar, leads in rice production, and produces cotton, corn, potatoes, fruits, tobacco, strawberries and truck crops in abundance.

It can readily be seen why Louisiana, because of its immensely valuable strategic importance, should figure prominently in national defense plans for this rich state would be prime booty for any invader. An army and navy could operate almost self-sufficiently from the state's vast and varied natural resources.



■ Another view of Camp Beauregard, showing the new cantonments recently erected. Construction work on a third camp is under way at Camp Claiborne, 14 miles south of Alexandria. In all, over 100,000 men are expected to be housed in the three army camps in the Alexandria area.

"SNAKES! I HATE THEM!"

PART II

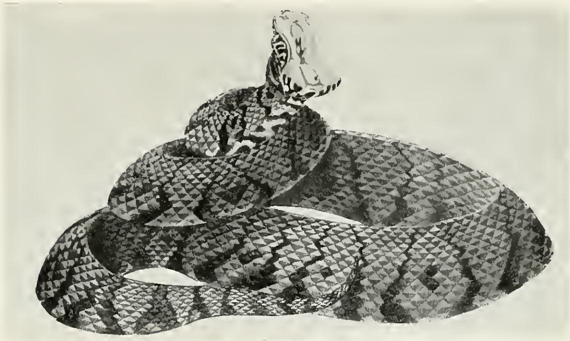
by

James Nelson Gowanloch*

Part I of this discussion which appeared in the preceding (Summer 1940) issue of the Louisiana Conservation Review provided a discussion of the biological significance of snakes, an account of some snake legends, technical illustrations depicting the six poisonous Louisiana species, together with a brief summary of the most practical and successful treatments available for poisonous snake bite.

It is the purpose of the present article to relate facts concerning Rattlesnake's fangs, certain legends concerning Rattlesnakes, an explicit account of the six species of poisonous snakes that occur in the State and other snake lore. Lastly is provided a bibliography of books and scientific papers of particular value to the student of snakes in Louisiana.

Every nature student should acquire some of these references since perhaps nowhere else in biology do there occur more fantastic and erroneous ideas than those concerning snakes.



(From Kelly after a painting by R. F. Deckert.)

The Cottonmouth, AGKISTRODON PISCIVORUS (Lacepede). A dangerously poisonous semi-aquatic species which feeds commonly on frogs, fish, rodents and birds. Heavy-bodied, it reaches a length of more than three feet. The illustration shows clearly the sheathed poisonous fangs in the upper jaw.

The Rattler's Fangs

The construction of a Rattlesnake's fang is peculiar in that it is not as if a tube had been bored through a solid tooth, but is, instead, really a tooth which has become flattened, the edges becoming progressively rolled over until they meet, part of the original external tooth becoming the lining of the tube. The poison fangs also differ from ordinary teeth in the fact that although securely socketed in the jaw bone (maxillary), they are movable, not because of their ability to move in the socket, but because of the ability of the bone, itself, to move. This movement is accomplished by small muscles (spheno-pterygoid muscles), the contraction of which pushes forward the small, stout, triangular maxillary, which, being caused to rotate, moves the point of the poison fang in the arc of a circle until, instead of pointing backward, the poison fang points downward. Furthermore, this protrusion of a snake's fang is not automatic but is under the control of the snake, the Rattlesnake being able to open its mouth without extending the poison fangs. Further still, the reverse act of swinging the extended fangs back into their usual retracted position is also quite voluntary. This folding back is accomplished by the action of other sets of muscles (the ecto-pterygoid and spheno-palatine muscles). The return of the poison fangs, which may be observed every time after the snake has struck, markedly resembles the shutting of the blade of a pocket knife. The writer has watched Rattlesnakes, after they have fed, repeat this operation of folding the fangs back a number of times in rapid succession. The poison fangs of the Rattlesnake are further protected by a folded membrane which extends over the tooth like a hood, and, when the fangs are erected, slips off the tooth like the finger of a glove and gathers in folds at its base.

The poison gland is the structure in which the venom of the snake is elaborated and stored. In large Rattlers it may be as much as an inch long and contains as much as 15 drops of poison. The ejection of the poison itself may be highly forcible, due to the action of one of the three sets of temporal muscles which are so situated that the swelling of the muscle in contraction presses upon the poison gland. It is not, therefore, necessary that, to eject the poison, the snake must strike any object with its fangs. This is well illustrated by the fact that a snake in a wild strike (missing the object struck at) has been observed to spurt out its poison to a distance of five or six feet. Still a further device, protective in character for the snake itself, has been observed and described by students of snakes. This is that if a Rattler were to miss its strike and close its mouth it would appear inevitable that it would drive its erected poison fangs into the floor of its own mouth cavity. This, however, does not happen because, due to some peculiar arrangement of the bones of the skull, the closing of the mouth swings the points of the poison fangs outward so that these fangs completely clear the lower jaw.

When all of this chain of complicated events has been rapidly completed the snake disengages its fangs from its victim, an act sometimes difficult if the part struck is small or if the fabric of clothing is present and many of the snake's teeth have become entangled. Once this disengagement is accomplished, the Rattler again throws its body into a pile of coils, raises its head and prepares to strike with lightning speed again at the object. The effective striking distance is less than the total length of the snake, in spite of fantastic popular stories of Rattlers which are able to project themselves bodily through the air.

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*Chief Biologist, Department of Conservation.

One question frequently asked is the age at which Crotaline snakes become poisonous. The writer, on one occasion, was struck by a single fang of a Cottonmouth Moccasin, the snake being less than a month old and only about 7 inches long. The fang entered on the distal end of the dorsal surface of the right index finger. It was obvious that only a small quantity of venom could have been injected. The sensation of sharp pain, followed by numbness, rapidly progressed along the finger, through the hand to the wrist, from the wrist to the elbow, and from the elbow to the shoulder, a surprisingly extensive effect for such a small serpent. Treatment, consisting of cutting and irrigating the site of fang entrance, was applied. The effects persisted over a period of some twelve hours. Crotaline snakes, however, have been proven to possess the ability to inflict poisonous bites even when newly born. Stadelman (1928) caused himself to be bitten by a Copperhead, which was only six hours old. The slight pain was followed by an intense burning, and, within an hour and a half, edema involved the entire outer surface of the fore arm, the site of the bite being the belly of the extensor digitorum communis muscle of that left arm. Ten hours later, the swelling had progressively developed, and was still continuing. Seventeen hours later, swelling was still continuing, and so progressed for a total of twenty-one hours after the bite. This time proved to be the turning point in the reaction to the snake venom. Evidences of the reaction of the tissues at the site of the wound were still apparent 18 days after the bite. Stadelman accordingly states: "One may conclude that Copperheads only six hours old are in possession of a complete functional venom apparatus, capable of injecting a dangerous amount of venom, particularly if the victim be very young, or in poor condition."

Some biologists have expressed the theory that Rattlesnakes developed rattles as a specific protection against the vast herds of American Bison (Buffaloes) that roamed North America through long periods of our continental pre-Columbian history. The manner in which Bison would come to associate the rattling of Rattlesnakes with danger is obvious. Carr (1940) cites one case, involving domestic cattle, where "I saw a cow step on a small ground rattler, mashing its tail into the mud; the snake struck the cow on the fetlock three or four times before she moved her hoof, after two or three minutes she turned and regarded the bitten foot in evident amazement, shook it in the air a couple of times and ran off bawling; three days later I saw the cow again; she showed no ill effects from the experience."

There is another popular idea that other animals instinctively fear the sound of a Rattler's rattle. This is not true, since repeatedly the writer has brought dogs that had had no previous experience with Rattlesnakes up to cages of Rattlers, and the only response such dogs exhibited was only of alert curiosity.

Another popular faith, generally held by cow-boys, is that a rope wound of horse-hair and spread in a circle will prevent a Rattler from crossing it. This idea is false since experiments show that the Rattler is not deterred by this device.

The enemies of poisonous snakes are various. Eagles, large hawks and owls are known to feed upon them. Domestic animals also destroy snakes, especially is this true of hogs, whose immunity to the bite of even large Rattlers is probably due to the fact that the venom injected through the heavy skin into the subjacent layer of fat is, because of the reduced vascular circulation in such a layer, delivered in very minute quantities at a time so that the hog can build up an immunity to the snake poison. The well-known King-snake is a cannibal, and includes among other snakes, poisonous species. Observations show that the King-snake, itself not poisonous, is quite immune to the effects of Rattler venom, and, therefore, with its clever strategy can capture and crush to death a Rattlesnake without itself being harmed.

Direct Sunlight Kills Snakes

Contrary to popular belief, Rattlesnakes and other serpents, even those normally living in arid areas, are sensitive to sunlight, being fatally injured by relatively brief exposures to full sunlight. Experiments on two western species of Rattlesnakes (the Desert Diamond-back, *Crotalus atrox*, and Sidewinder, *C. cerastes*) show exposure of these snakes to full desert sunlight caused death within from seven to ten minutes. Apparently the bodies of these snakes could not endure a temperature of over 46° C., (approximately 115° F.)

Louisiana Poisonous Snakes

Lastly, to survey the poisonous snakes of Louisiana it may be said that they include the following:

The Coral-snake belongs, in its type of venom, to the Cobras, those deadly snakes of Asia and Africa, while the Pit Vipers belong to an entirely different group.

The Coral-snake, belonging to the family Elapidae, is a small slender creature, brilliant in color, its pattern consisting of alternate and circling rings of black, red and yellow. Nocturnal and secretive in habits, it is usually observed only by accident. Often described as docile in behavior, it is nevertheless a deadly snake, whose vivid coloring may attract children to play with it, often with most serious results.

Two other snakes which are completely harmless somewhat resemble the Coral-snake, and may be popularly confused with it. These are the Scarlet Snake and the Scarlet King-snake.

The Pit Vipers are the most important poisonous snakes of the United States, including as they do all the Rattlers, the Copperhead and the Cottonmouth Moccasin. Pit Vipers derive their name from the fact that on the side of the head almost halfway between the eye and the nostril, there is present a small but easily preceptible pit the function of which is still obscure.

The Pit Vipers of Louisiana may be divided into three groups. First, rattlesnakes of the Genus Sistrurus. This genus is distinguishable from the rattlers of the Genus Crotalus by the fact that the upper surface of the head between the eyes is covered with relatively large plate-like scales, whereas the other rattlers, belonging to the Genus Crotalus have the corresponding area of the head covered with very numerous, relatively small scales. Second are the rattlers of the Genus Crotalus. Here belong the largest and fiercest of all North American Rattlesnakes, the Diamond-back Rattler, and also the Canebrake Rattlesnake. Third are two closely related species, neither of which possesses a rattle, the Copperhead and the Cottonmouth Moccasin. These two species belonging to the Genus Agkistrodon, have the above described area of the upper surface of the head covered with relatively large plate-like scales, thus resembling the Pigmy Rattler. Descriptions of each of these snakes will be given later.

Poisonous snakes look after themselves quite competently, and, therefore, are seldom seen. An instance of this came to the writer's attention when in the course of clearing of swamp land along a highway, workers, in a stretch of only 100 yards, captured five Rattlesnakes in two days. Only by the complete destruction of their cover was their presence revealed.

The Rattlesnakes, Cottonmouth Moccasin and Copperhead belong to that group of the serpents known as the Solenoglyphs. These serpents occur throughout temperate and tropical America. All of them bear their young alive, with the single exception of a very deadly South American species, the Bushmaster, *Lachesis mutus*, in which species the female lays a nest of eggs. Although they are termed pit-vipers, no true vipers occur in North, Central or South America. The true vipers especially flourish in tropical and south Africa.

The Coral-snake belongs to that group of serpents designated as the Proteroglyphs. This sub-family includes some of the most spectacular and deadly of all known snakes, and, in Australia they so flourish that that continent is probably the only place in the world where poisonous snakes far outnumber non-poisonous ones.

The technical names of the poisonous snakes of Louisiana and their meanings are as follows. It should be noted that the following list includes certain subspecies, the general range of which is not indicated since only the ranges of the species themselves are given in the following paragraphs. The subspecies named is the one recognized as occurring in Louisiana.

The Coral-snake, *Micrurus fulvius fulvius* (Linnaeus). *Micrurus* is from hte Greek, meaning "small tail," while *fulvius* is Latin, meaning "reddish-yellow."

The Copperhead, *Agkistrodon mokasen Beauvais* (Linnaeus). *Agkistrodon* is from the Greek, meaning "hook tooth," *mokasen* is from the Indian word "moccasin."

The Cottonmouth Moccasin, *Agkistrodon piscivorus* (Holbrook). *Piscivorus* is Latin meaning "fish-eater".

The Pigmy Rattlesnake, *Sistrurus miliarus streckeri* (Gloyd). *Sistrurus* is from the Greek, meaning "rattle" and "tail"; *miliarus* is Latin, meaning "of millet"; *streckeri* for Dr. J. K. Strecker.

The Canebrake Rattlesnake, *Crotalus horridus atricaudatus* (Linnaeus). *Crotalus* is from the Greek, meaning "a rattle"; *horridus* is Latin, "dreadful"; *atricaudatus* is from the Latin meaning "black-tailed".

The Diamond-back Rattlesnake, *Crotalus adamanteus* (Bearvais). *Adamanteus* is Latin, meaning "diamond-like".

The Coral-snake

Of the Elapine Snakes, only a single genus occurs in the New World and of this genus, two species occur in the United States. One is the Coral-snake, *Micrurus fulvius* (Linnaeus), whose range extends from North Carolina to Florida and westward through the Gulf states to Mexico. Abounding in humid places, it is usually a docile species. The Sonoran Coral-snake, *Micrurus euryxanthus*, is a more southwestern species, apparently limited in the United States to a distribution in the region between the Rocky Mountains and the Colorado River, southward into northwestern Mexico and California. Although inhabiting dry areas, this snake also typically lives underground. Two other Louisiana snakes may be popularly confused with the deadly Coral-snake, and for this reason, there is here given a description of the species concerned. The Coral-snake attains a length of probably 18 inches to two feet. Its color pattern is startling, consisting of black followed by yellow, followed by red, the bands encircling the body of the animal, each black band being bordered by two yellow ones. The head exhibits a yellow band across the center, with it a black ring. The yellow body rings are very narrow.

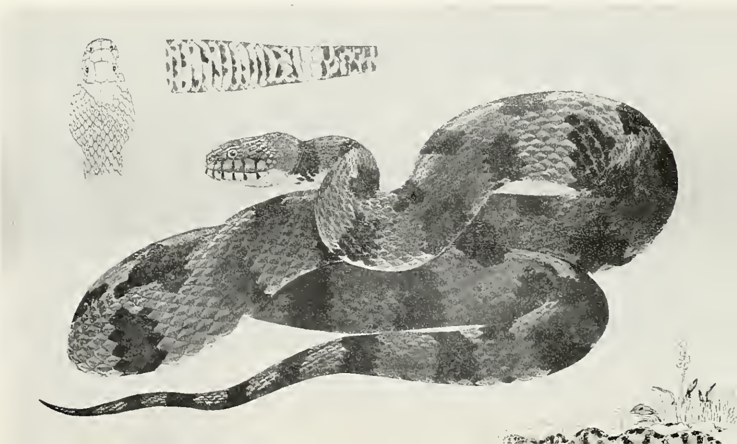
The Scarlet King-snake, *Lampropeltis elapsoides* (Holbrook) may conceivably be confused with the Coral-snake. In this species the red snout is followed by a white area, and the pattern consists of a design of two black bands, separated by an area of red and between each of these there is an area of white, so that black, red, black, white constitute the pattern. The black bands are about two scales wide, the red four to six or wider, the white one to two. This body color thus sharply contrasts with the Coral-snake's large rings of red and black, separated by narrow yellow rings. The Scarlet King-snake is a harmless and a beneficial species occurring from North Carolina to Florida and westward to the Mississippi. It appears never to be numerous.

The Scarlet Snake, *Cemophora coccinea* (Blumenbach). Cope, is the second species possibly to be confused with the Coral-snake. The head of this species is scarlet with a black band across the eyes. The dorsal surface is marked with large scarlet blotches surrounded by black bands, and between tnese black surrounded scarlet bands, there is a band of yellow. A docile species, the Scarlet Snake feed on frogs, lizards and insects, and hides habitually under fallen logs. It occurs in Maryland southward to Florida, Alabama and Louisiana.

The Copperhead

The Copperhead has acquired more popular names than most of our poisonous snakes, being known as Highland Moccasin, Chunkhead, Death Adder, Pilot Snake and Poplar Leaf. The reader will observe that the specific technical name of this species is *mokasen*, although the Moccasin is a different snake. The Copperhead is a medium snake, averaging about two and a half to three and a half feet long. Ditmars records one specimen four feet, five inches in length. The Copperhead is a shy and secretive animal, evidently active chiefly at night. Its presence may thus remain unsuspected. One instance recorded by Netting near Pittsburgh relates that a farmer killed 49 Copperheads on his property in a year. The Copperhead ranges from southern New Hampshire to central Illinois, west to middle Kansas, and the Texas Panhandle and south through Texas to northern Florida. Copperheads have been known to eat mice, squirrels,

(From Kelly after a painting by R. F. Deckert.)



The Water Pilot, NATRIX TAXIPILOTA (Holbrook). Known also as the Brown Watersnake, this species has been known to climb trees as high as twenty-five feet. Shy and active, it is probably the swiftest swimming of all our snakes. Watersnakes are serious enemies of fish and should be unhesitatingly destroyed. The Brown Watersnake reaches a length of five feet and has even in captivity a disposition vicious and sullen.

shrews, birds, frogs, insects, salamanders and even oppossums. The young, born in late summer, usually number four to nine. Like the young of the Moccasin, little Copperheads have brightly yellow tails, the color of sulphur, which, when excited, they rapidly vibrate.

"Description: The dorsal surface is light brown and copper color, the head generally being bright copper, thus the name 'copperhead'. Darker brown blotches form dumbbells across the back, the contracted portion being over the vertebral column. Sometimes these brown spots do not continue and meet the one on the opposite side, or they may alternate. The ventral surface is a dull yellow with dark blotches on both sides" (Haltom).

The Cottonmouth Moccasin

The Cottonmouth Moccasin is the most abundant of all our Louisiana poisonous snakes. Nowhere, has the writer observed them more numerous or larger in size than in flooded areas, where every protuberance may have its Cottonmouth sentinel. The Cottonmouth ranges from southeastern Virginia, south through Florida, north in the Mississippi Valley to southeastern Missouri, southern Illinois, west to central Texas, and up the Rio Grande to the Pecos River. It is one of the largest of our North American poisonous snakes, and may become heavy bodied. Four feet is a frequent length. The white appearance of the mouth when the snake prepares to strike has given to this species its common name of Cottonmouth. "Congo" is another popular name used both by Creoles and Acadians in Louisiana. "Congo" is also applied to the harmless but usually greatly dreaded amphibian, the Mud Eel (*Siren*). The writer has observed that much popular confusion exists with reference to the numerous, non-poisonous water snakes, for in spite of the dissimilarity in appearance, many people believe the water snakes (various species of *Natrix*) to be a kind of Cottonmouth Moccasin. The three Crotaline characters of pit, cat-like eye and lance-like head, serve immediately to identify the Cottonmouth Moccasin. Its specific name *piscivorus*, "fish eater", is well earned. The Moccasin also eats amphibians and rodents. It is a highly poisonous, vicious species, and records of the Antivenin Institute of America indicate that it is responsible for most of the snake bite injuries in the Southern and Gulf states with the exception of Texas.

"Description: On the dorsal surface this snake is dark brown and black It often appears to take on a muddy tinge. Crossing the body are about twelve to fifteen wide black bands inclosing the brown blotches, which become wider at each side. The head is solid dark brown or black on the dorsal surface. A yellow band extends from eye to neck. Above this band is a blackish streak. Ventral surface is yellow with blotches of brown. Tail is dark on both sides" (Haltom).

The Pigmy Rattler

The Pigmy Rattler, the smallest of our Crotaline snakes, belongs to the Genus *Sistrurus*. It displays on the upper surface of the head a formation of relatively large plate-like scales, resembling in this respect, both the Copperhead and the Cottonmouth, and differing from the Timber Rattler and Diamond-back, in which the two last named species the upper surface of the head is covered with numerous, relatively small scales. Commonly called also the Ground Rattler, this species feeds chiefly on frogs and small rodents. Its rattles are very small, and their sound feeble. Wide in distribution, it ranges from southeastern North Carolina, south to Florida, west through eastern Texas and Oklahoma, and north through Arkansas to southern Missouri. It is, by preference, a snake of dry ground, living among leaves in the grass, but the writer has observed it also in wet land. In spite of its small size, it is quite poisonous, and several instances are known of the death of young people due to the Pigmy Rattler's bite.

"Description: Brownish, gray to ground color on dorsal surface. There are between thirty-eight and forty-five darker blotches on back from head to tail. A narrow black band encircle blotches A dark streak with a light streak beneath extends from below center of eye to angle of mouth" (Haltom).

The Diamond-back Rattlesnake

The Diamond-back Rattlesnake is the largest of all North American rattlesnakes. Correspondingly, it is also the deadliest. Should the victim struck by a Diamond-back survive, often extensive permanent damage remains. The Diamond-back ranges from southern North Carolina southward to Florida Keys and westward to the Mississippi River. The writer can find only a single acceptable record of the occurrence of the Diamond-back in Louisiana. All the other reputed observations proved when traced down to be Canebrake Rattlesnakes. Vicious, it is also brave, and will advance more often than retreat from danger. Remarkably accurate in its aim, the Diamond-back seldom misses. Altogether, it is a seriously dangerous creature. The Diamond-back feeds chiefly on rabbits, and for some reason, as far as it is known, does not feed on birds.

"Description: Gray to brown on dorsal surface, with very distinct diamond markings which are much darker, often black. These are bordered by yellow, generally about one scale wide. The tail does not have the characteristic diamonds as they fuse to form cross bands" (Haltom).

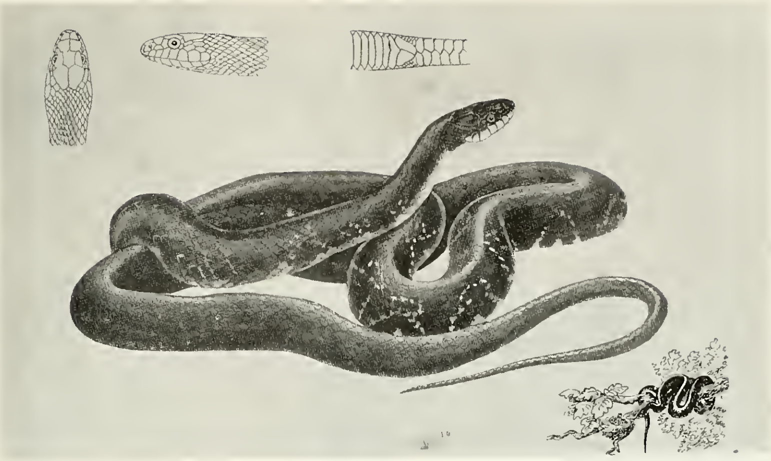
The Canebrake Rattlesnake or Timber Rattlesnake

The Timber Rattler is a particularly beautiful species, attaining usually a length of about four and one-half feet. The writer has noted, however, one specimen, from Buras, Louisiana, that was six and one-half feet long. A wide range exists in the coloration, the dorsal surface being yellowish-brown, sometimes dark brown, crossed by transverse V-shaped bands of darker brown to black. These chevron-like bands are bordered with black and then yellow. The ventral surface of the Timber Rattler is yellowish-green, with dark blotches. Banded Rattler, and Velvet-tail Rattler are other names popularly applied to this species. Wide in range, the Timber Rattler occurs from Maine to Georgia, and westward to the Great Plains. It is a dangerous snake, although it usually rattles before striking. In one instance, an 18-year-old girl, struck by a four and one-half foot Timber Rattler, died within thirty minutes. The writer kept a four and one-half foot Timber Rattler under observation for several months, during which time the snake rapidly became so familiar with its surroundings, that it would only rattle when a stranger appeared. This specimen captured near Houma, was particularly beautiful in coloration, and fed readily on white rats, which it struck and killed. The Timber Rattler is readily distinguished from the Diamond Back by the shape of the chevron-like dark bands, the darker markings of the Diamond-back being, as the name of the snake indicates, diamonds instead of V's. The Timber Rattler in nature, feeds extensively on rabbits and rats, sometimes on birds. Although it is fond of haunting ledges in woody and hilly districts, it also is found even in swamps.

"Description: The dorsal surface is a yellowish-brown, often dark brown, crossed by transverse 'V' bands of a darker brown to black. These stripes or bands are bordered with black and then yellow. Head is uniform from above. Tail is dark brown to black in adults. Rattles large. Ventral surface yellowish green with dark blotches" (Haltom).

Rattler's Rattles

The rattles of Rattlesnakes are structures unique in the animal world. Many snakes, even harmless species such as



(From Kelly after a painting by R. F. Deckert.)

The Pilot Blacksnake, ELAPHE OBSOLETA (Say). Attaining a length of over eight feet, this species first strikes with a lightning blow at rat, rabbit or squirrel and almost instantly envelopes its prey within its crushing coils. The baseless legend that it guides pit vipers away from danger has given it its common name.

the Hog-nosed Snake (called popularly the Spreading Adder or Puff Adder) possess the habit of rapidly vibrating their tails when excited. If the snake happens to lie coiled among dried leaves, the resulting sound may closely resemble that of a rattle. Snakes shed their skins at varying intervals and the formation of the rattlesnake's rattle is simply the result of the fact that, in each successive molting, a peculiar interlocking button is formed and remains on the snake's tail. The popular idea that the number of "buttons" in a rattle indicates the snake's age, is completely wrong. The shedding of the snake's skin depends upon many variable factors, amount of food, rate of growth, temperature, etc. Furthermore, the wear and tear to which the snake's activities expose the rattle, cause the abrasion and breaking off of variable numbers of the buttons. The number of buttons, thus, if all were retained, would be simply the record of the number of times the snake has molted. There is a popular idea, that a rattler cannot rattle while its rattle is wet. The writer has experimentally and readily disproved this many times, by the simple operation of turning water on a caged and angry four and one-half foot Canebrake Rattlesnake. Wetting the rattles changed the sound, producing a slightly muffled rattle, still, however, clearly audible.

Rattlesnakes No Gentlemen

Rattlesnakes, in spite of much sentimental "wild west" writing to the contrary, are not gentlemen. They are sinister and treacherous creatures, and the idea, attractive to so many amateur naturalists, of keeping them as pets for observation, is gravely foolish.

Like many other reptiles, snakes retain, to a high degree, some measure of reactivity following death, and thus give rise to the theory, familiar to every child, that a dead snake will wag its tail until the sun goes down. The snake's tail and the sunset have nothing to do with each other, the phenomenon of this movement being merely an evidence of the relatively high degree of independent survival of body tissues after the death of the individual, which survival is especially notable in reptiles. More dramatic and dangerous is the fact that even a dead snake has been known to strike successfully the hand of the man picking it up. The stimulus received by the snake when it is picked up by the tail, may suffice to set in action the machine which still retains the ability to accomplish a swift reflex action. As Netting has suggested, if you consider that your nerves are strong enough, chop off the head of a poisonous snake, then pinch its tail and watch, with whatever calmness you can muster, the accuracy with which the bloody and headless stump will strike your hand.

Popularly there exists the idea that the snake venom is for protection only. This is not true. It is obvious that it is easier and lazier for a Rattler to strike a rat that is running past it, and thereafter eat that rat, if, as a result of the strike, the rat, within a period of minutes or even seconds, falls over and dies. Venom does, of course, constitute an instrument of protection as well, but the use of the venom and the poison apparatus in food taking is popularly overlooked.

Snakes, poisonous or harmless, will continue to be sinister objects of human interest as they have always been since the days of Eve and of Cleopatra.

The Bureau of Research, Department of Conservation, will be glad to cooperate in the identification of any specimens of snakes living or preserved submitted to it. Such specimens should carry the precise statement of the place and time of capture.

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Many people dislike skunks, but the people of the State of New York owe a considerable debt of gratitude to one of these animals. For, believe it or not, a skunk has entered into the employ of the New York State Conservation Department.

STATE ENTERS PARTNERSHIP WITH CONSERVATIONISTS

[Continued from Page 10]

But that's no reason we can't work out some method of waste disposal other than running all this pollution into our streams where it will kill every last fish and drive most of the game out of the country. That's already happened in those crowded industrial centers I spoke of a while ago. Our Pollution commission is going to work out something that will do the trick, and that'll be another big step forward.

I have cited these things to show you that your new partner is not only talking co-operation with you, but doing it. We're doing it, as I said before, not because we have to, but because it's right. Now, how about you folks? It's quite true that we can put on a big enough force of men to MAKE you cultivate that rich sportsman-tourist crop whether you want to do it or not. But we'll never get anywhere that way. You know it. Sam Jones knows it. We all know it. But just as in this new partnership we did the things, some of which I have briefly outlined, not because we had to do them, but because it was the eternally and everlastingly RIGHT thing to do, so we hope that you, as our partner, will do your share not because somebody makes you do it, but because that, too, is the eternally and everlastingly right thing to do.

With all of us working together on that kind of a basis, with you preaching and practicing the doctrines of conservation and mutual helpfulness among your neighbors in your home communities, with us administering the technical conservation job for the benefit of the game and not for political profit, with that kind of teamwork cultivating the prospective tourist crop, there'll be no stopping us. And the wildlife business that is now very bad will get better so quickly that before we know it, it will not only be good, but very good.

FUR-FARMING INCREASE CONSERVATION FEATURE

The most phenomenal development in the field of fur-animal conservation in recent years is the production of fur animals in captivity, according to officials of the Fish and Wildlife Service of the Department of the Interior. The most spectacular and important enterprise is silver-fox farming, which industry has developed in two decades from a producer of 6,000 pelts in 1923 to 350,000 pelts in 1939.

Mink farming, Service officials declare, likewise is developing at a rapid rate and is now a popular phase of the industry. The production of ranch-raised minks is now estimated to be in excess of 200,000 skins annually.

SULPHUR WILDLIFE CLUB IS ORGANIZED

Immediately after the election of Gov. Sam H. Jones the sportsmen of Southwest Louisiana were filled with a new hope and felt that now would be their opportunity to present to the new Governor and legislature needed conservation laws. The movement first began with organization of Southwest Louisiana Wildlife Association in Lake Charles under leadership of Mr. John Flanders. After several well attended sessions in Lake Charles the group of Sulphur sportsmen decided to resign their membership in Lake Charles chapter and organize a separate chapter in Sulphur, Louisiana. A committee was appointed to draw up constitution and by-laws and first meeting was called on April 23rd to ratify Constitution and elect officers. The name chosen for group was Sulphur Wildlife Federation. Dr. W. A. K. Seale was elected President, Rev. W. H. Smith, Vice-President and E. J. Busch, Secretary-Treasurer. A five man Board of Directors was elected as follows: Robert Anderson, Herman M. Busch, C. J. Duhon, W. J. Cade and John Whatley. Monthly meetings were held and well attended; the paid membership is now 53 sportsmen.

The organization has planted 100 young quail received from the Conservation Department. Young birds were banded and placed in posted areas on which hunting will be prohibited for two years. Bands have been received from Federal Biological Department and the Federation will actively band young dove and quail raised in Southwest Calcasieu Parish next spring.

At one of meetings, H. L. McKnight of the Conservation Department spoke to group on conservation and his message was well received. The interest has been high among the members and officers and they alike feel that through this organization a new meaning has been placed on conservation and a much better observance of game laws and sportsmanship has been prevalent in the whole area.

The Federation sent two representatives to New Orleans meeting of Louisiana Wildlife Federation convention October 27th. A group of resolutions were drawn up and presented to Resolutions Committee at that time. The Sulphur unit has affiliated itself with the Louisiana Wildlife Group, the entire membership having paid dues to state organization. It is hoped that by banding ourselves together that we may further the cause of conservation and preserve for ourselves and those that come after us the abundant wildlife nature intended for us to have.

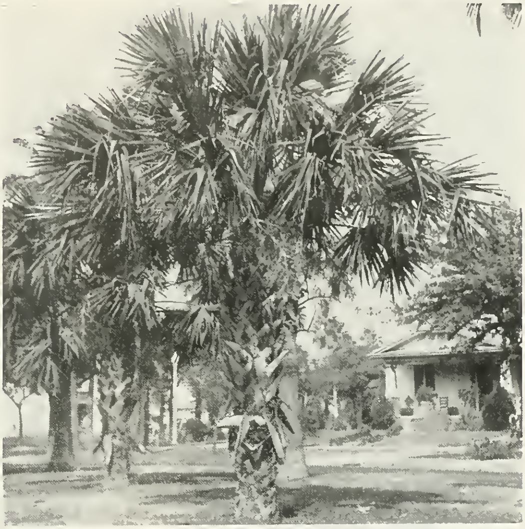
What Palms Grow In Louisiana

By
Miriam L. Bomhard

PART VIII

SABAL Adanson. (*Inodes* Cook, in part). Palmettos.

Distinguishing features: Mainly trees (up to 80 ft.) with slender or columnar trunk, a few species "stemless"; **i. e.,** with no visible trunk above ground; petiolebases often retained, splitting to form a crisscross pattern; bark white, gray or brown, roughened by leafscars or somewhat smooth; leafblades various—from (1) fan-shaped and almost in one plane with short weak rachis, and small triangular hastula, to (2) true "palmetto-type" with strong supporting winged rachis, the blade downwardly curved, and spear-shaped hastula, or (3) latter type modified; segments few to over 100, usually deeply divided, bearing a long filament in the clefts, at least when young; petioles **not** armed; flowering stalks (spadices) long, erect, spread or drooping, with many overlapping, tubular, pointed spathes, the lower empty, the remainder subtending subdivided branches bearing the flowers and fruits; flowers perfect, small, white or straw-colored; fruits fleshy, black or brownish, globular but frequently wedge-shaped at base; seeds brown, shining, more or less flattened, usually wrinkled below.



■ **Fig. 63. Victoria palmetto (S. EXUL). St. Bernard Circle, New Orleans.**

This American genus of palms includes 22 or more species native to the United States (from North Carolina to Florida and Texas), Mexico, the West Indies, Bermuda, Central America, and South America (Colombia and Venezuela) and thus is at home in both temperate and tropical climates. The origin and meaning of the word, **Sabal,** has never been explained but it is supposedly a native American name. Although palmetto, "little palm", has been applied to palms of certain other genera, this common name is now firmly established for the various kinds of **Sabal; palmetto** is also the specific name of the cabbage palmetto of the Southeastern United States.

Sabal is easily distinguished from certain other genera (**Washingtonia, Livistona,** or **Erythea**) of cultivated fan-leaved tree palms by the combination of unarmed petioles and crisscross of boot-halves. Most of the palmettos are trees. Of the kinds described as being "stemless" and having the leaves apparently coming directly from the ground one (**S. minor**) has a short, horizontal underground stem and in another (**S. etonia**), the subterranean axis resembles a corkscrew. **S. louisiana** is stemless under conditions and produces an erect trunk under others. The various species are often difficult to recognize; even the flowers and fruits are remarkably similar. Palmettos not only differ in character from youth to maturity but also with habitat conditions and are, even now, not well understood.

Palmettos usually form groves or occur in groups and not as isolated specimens. Except for a single station of the saw-palmetto (**Serenoa repens**), which has sharply saw-edged petioles, all the palms growing wild in Louisiana are of the genus, **Sabal.** Native Louisiana names include "latanier" or "latania", dwarf palmetto, swamp palmetto, etc. Palmettos or saw-palmettos, often both, are a familiar part of the native vegetation along the Gulf Coast.

This genus shows a wide range of leaf form. The type species, **S. minor,** has a rather small, truly fan-shaped blade, with the 28 or less segments radiating mainly from the base; the leaf is almost flat, very weak in the middle line where it frequently splits, and the hastula is short. In contrast, the leaves of the majority of the species (placed by Dr. O. F. Cook in a sparate genus, **Inodes**) have the distinctive "palmetto curve". The strong, downwardly curved, winged rachis (mid-rib), from which the upper segments arise, serves to brace the blade and hold it firm. The two halves of the leaf are partially clapped together upwards, as may be noted in the cabbage palmetto (**S. palmetto**); the hastula is elongated, like a spear. There are other species with leaves intermediate between these two types—one reason for not maintaining **Inodes**. Usually only the inner half or less of a palmetto leaf is solid; the outer portion is cut into segments, which are short-pointed or tapered, and frequently deeply divided. The long petioles, rather strongly rounded-convex below and flat or hollowed above, are never armed.

The graceful flowering stalks are usually as long as or longer than the leaves; they may be erect, spread, or drooping. Closely overlapping, tubular, pointed spathes cover the main axis of the spadix. The lower empty ones appear to form the peduncle or "handle"; from each of the succeeding spathes extends a main branch on whose ultimate subdivisions the flowers are borne. The various branchlets and flowers are subtended by a series of spathelets, bracts, and bractlets. The small white flowers, 1/3 inch or more in height, are perfect; **i.e.,** having both stamens and pistil, but not all of them produce fruits. They frequently have a sweet odor.

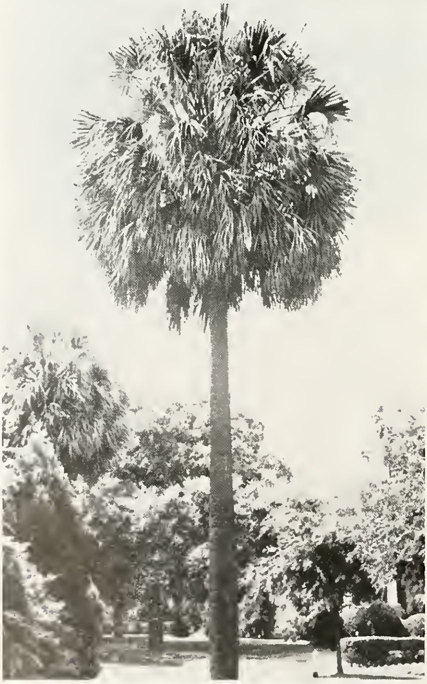
The fruits range in size from that of a small pea to slightly over an inch wide (**S. dugesii**). They are brown or black and practically spherical or drawn down into a balloonlike or parachute-shaped base. In general, only one of the three carpels develops, but sometimes, notably in **S. texana,** twin or triplet fruits are produced. The fruits contain a small amount of pulp and the thin inner membrane is easily separable from the single, flattened, brown or black seed. Birds eat the fruits and have probably contributed to the extension of the natural range of some of the palmetto species.

The trunks, leaves, fruits etc. of palmettos have been put to all manner of local uses and some species furnish raw materials for articles of trade. Eight species of **Sabal**, both wild and cultivated, have been tentatively recorded for Louisiana.

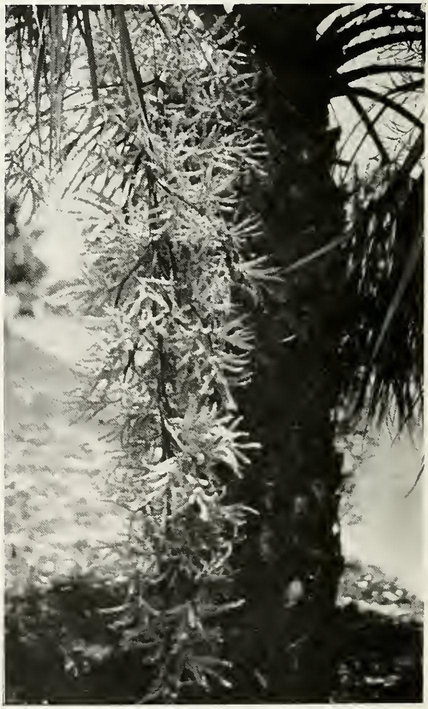
S. CAUSIARUM Linnaeus. (*Inodes causiarum, I. glauca*). Puerto Rican palmetto; hat palmetto.

Causiarum, meaning "of hats", is an appropriate name inasmuch as palmleaf hats are made in large quantities from this species. These palms grow in northwestern and western Puerto Rico, mainly near the coast in sandy soil; they also occur on coastal plains and in river valleys. Mr. Claud L. Horn, horticulturist of the Puerto Rico Agricultural Experiment Station, informs me that there are stretches of as much as ten miles in which "the palms appear in gregarious formation in pastures and cultivated fields". He also writes, "As one would suspect, many of the cabins which are distributed among the groves of palms are miniature factories for the manufacture of hats, baskets, brooms, and other articles made from the tough leaves of this palm. This species is really of considerable economic value in Puerto Rico." Fig. 57 is one of a number of excellent photographs for which I am indebted to Mr. Horn.

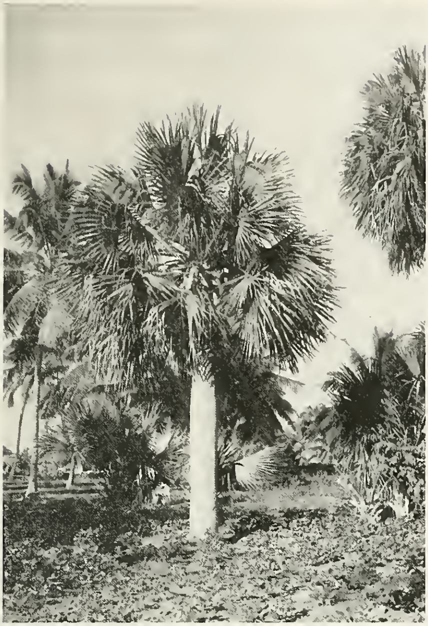
This handsome species is easily distinguished from other palmettos in Louisiana by (1) the massive, nearly columnar, pale gray or whitish truck, bare except for the crisscross of large planklike boots near the crown, (2) the huge light green leaves with strongly arching midrib, and,



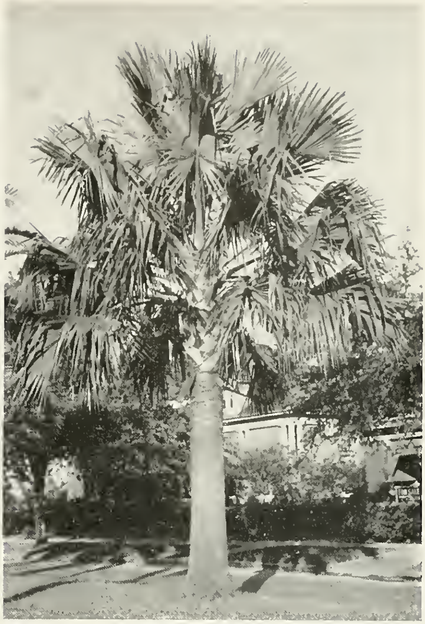
■ **Fig. 61. Habit of a mature cultivated cabbage palmetto (S. PALMETTO). Audubon Place, New Orleans.**



■ **Fig. 62. Flowering stalk hanging to the ground in a closely trimmed tree. (S. PALMETTO). Carrollton Ave., New Orleans.**



■ Fig. 57. Puerta Rican palmetto (S. CAUSIARUM). South of San Antonio, Aguadilla, Puerta Rico. Photograph by the Puerto Rico Experiment Station of the U. S. Dept. of Agriculture.



■ Fig. 59. S. CAUSIARUM. Hickory and Carrollton, New Orleans.

above all, by (3) the conspicuous, nearly white, birthbark-like strips margining either side of the petioles for almost 1/3 their length and often hanging partly free as papery ribbons. The leafsheaths, of which these strips were a part, early break down into fibers (mattula) and are torn away along with the petiole bases.

The Puerto Rican palmetto may become 50 ft. tall; the trunk measures 2 ft. or more in diameter at the base and tapers slightly upwards. The "bark" is somewhat rought and indistinctly marked by leafscars. The sturdy petioles hold the arching leafblades well out from the trunk at a semi-erect angle, making for a beautifully proportioned, elegant leafcrown. The petioles are deeply hollowed above with a slight ridge in the upper portion and rounded-convex below, with edges sharp and upturned. The blades average 7 1/2 ft. in length, being longest on either side of the middle line, where the heavy, winged, curved rachis ends in a few long fibers. The origin of the 106 or so segments, at most 3 inches wide, can easily be detected. They taper decidedly at the tip and eventually hang over or extend in various directions. The crown of a mature tree does not have the "thready" appearance so characteristic of the cabbage palmetto (next described).

The stout flowering stalks usually extend somewhat beyond the leaves, thus averaging 13 ft. in length, and are, as far as I know, never drooping. The lower branches measure 2 1/2 ft. or more. The thickish white flowers appear about the end of June in New Orleans and the grayish fruits are ripe in October.

I know of only two specimens of this palmetto in Louisiana; they have been growing on the neutral ground of Carrollton Avenue, near St. Charles, in New Orleans for a number of years. The older one, with a trunk height of about 15 ft., first flowered and fruited in 1938 (Fig. 59). I consider this to be the handsomest of the palmettos to be seen in Louisiana. If these two trees survived the severe weather of this winter, they are certainly to be recommended for extensive planting.

S. PALMETTO (Walt.) Lodd.

(*Inodes Palmetto, I. schwarzii; S. jamesiana* is referred here). Cabbage palmetto; Carolina palmetto.

The cabbage palmetto is native to the Southeastern States. From certain islands near Cape Fear, North Carolina, it extends along the coast in South Carolina and Georgia and then spreads out through most of Florida—to the Lower Keys in the south and westward to St. Andrew's Bay, near Panama City. The palmettos of the Bahama Islands have been distinguished as a variety. Large groves exist in many parts of Florida. The most extensive, approximately 150,000 acres, occupies Indian Prairie. Sometimes called Palmetto Prairie, between Lake Okeechobee and the Peace River watershed, "one of the most remarkable palm regions of the world".[1]

Not exacting as to habitat, this palmetto grows in dry, rocky, or wet places and near fresh or salt water. Where the water level fluctuates, the development of roots at the base of the trunk serves to adjust the palmettos to changing conditions. An adaptable species of such wide distribution naturally varies in size and growth form; also with age Fig. 60 shows a young wild plant in sand on the Isle of Palms, South Carolina. Cabbage palmettos have been known to attain 80 ft. in height, but average 50 ft. The usually slender trunk measures a little over a foot in diameter; it may be stockier and twice as thick. Trunks of old wild specimens, especially near the sea, are often fantastically twisted or curved. Ordinarily the crisscross of rather slender boot-halves clothes the entire trunk, particularly in cultivated trees, and the rather fibrous mattula is distinctly visible in the triangular spaces between the boots. However, both planted and native trees exhibit an individual peculiarity in that among those of the same age growing side by side, some retain the boots while others cast them off. The grayish brown bark varies from nearly smooth, marked by thicker fibrous leafscar lines, to distinctly ridged or ringed.

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[1] Small, John K. "The Cabbage Tree—Sabal Palmetto". Journ. N. Y. Bot. Garden 24: 145-158. 1923. Very interesting historical data is included in this discussion of the cabbage palmetto.

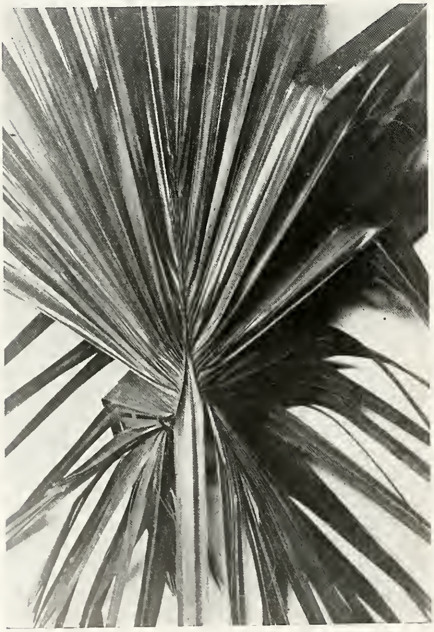
The leafblades of Louisiana specimens measure over 5 ft. in length and average at least 3 ft. wider. The two halves stand stiffly clapped together upwards from the decidedly curved rachis in a "rooster-comb" effect, but the outer two-thirds of the blade is cut into about 88 rather long-tapering, slender, deeply split segments which stand out in various directions, some drooping. This, together with the long, strong, black (pale at first) threads dangling in the segment clefts, gives the entire rounded crown a dishevelled appearance; it may be fairly dense and heavy, especially in older planted trees (Fig. 61). The segments nearest the 5-inch long hastula are narrower and somewhat bunched. The comparatively slender petioles usually exceed the blades—their upper surface is nearly flat across and the margins are sharp but not upturned.

The extremely graceful flower stalks with about two dozen spreading branches begin to bloom in June. They frequently hang down on young trees and on those which are closely trimmed (Fig. 62), but are stouter and practically erect on older trees, extending a distance beyond the leaves (Fig. 61). The entire spadix comes into bud at one time. The flowers are small, white, have a sweet odor, and are swarmed over by bees and wasps. An enormous quantity of the sperical, shining black fruits are produced toward the end of October; they are comparatively small (3/8 to 1/2 inch across) and the slightly flattened brown seeds are about 1/4 inch wide.

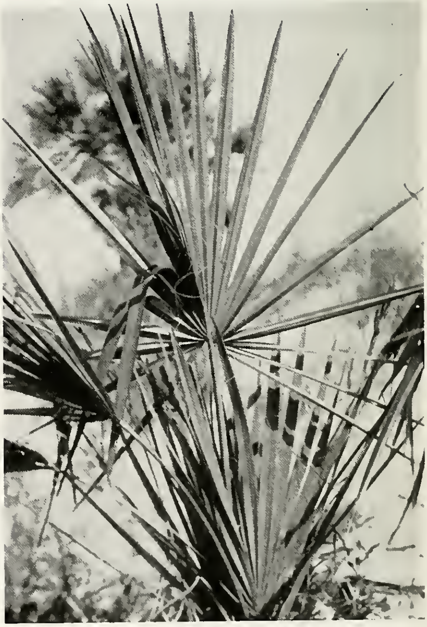
Fortunately, the cabbage palmetto is nicely adapted to cultivation, and it is planted throughout the region where it is native and also along the Gulf Coast. It has not proved successful in California. There are few specimens in Louisiana outside of New Orleans, where it thrives on avenues and in parks, some trees being 35 ft. tall (Part I, Fig. 6). A great many young specimens of this and the Victoria palmetto **(S. exul)** have been set out at the New Orleans Airport. It is easily raised from seed.

The cabbage palmetto is a very useful species. The wood is used for fences and construction purposes and is durable for under-water piling. The leaves or sheaths serve for thatch, mats, hats, brooms, and brushes. The manufacture of the latter amounted to a sizeable industry in northern Florida in the late 1890's. Even today, whiskbrooms of "genuine Florida palmetto" can be purchased in five-and-ten-cent stores. The bud or "cabbage" is edible and familiar in "heart of palm" salad. (See Part I, pp. 39-42). Strips of the young leaves are shipped to the North for use on Palm Sunday.

The state seal of South Carolina, known as the Palmetto State, bears a diagrammatic representation of a cabbage palmetto growing erect on the seashore, an oak tree torn from the ground at its base. This significantly commemorates the victory on June 28, 1776, of the Americans, who, protected by a rude fortification of cabbage palmettos, overpowered the attacking British fleet.



■ Fig. 60. Young cabbage palmetto (S. PALMETTO). Isle of Palms, South Carolina.



■ Fig. 65. Upper surface of leaf, showing hastula and upper part of petiole. (S. EXUL).

S. EXUL (Cook) Bailey. (*Inodes exul*). Victoria palmetto.

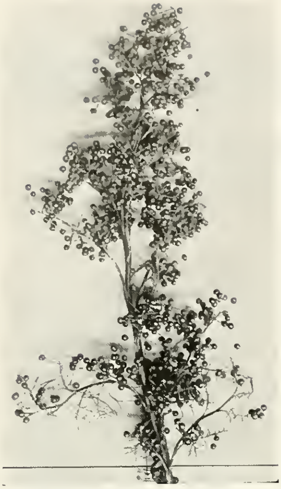
Dr. O. F. Cook founded this species in 1913 upon a palmetto growing on a lawn in Victoria, southern Texas. He gave it the name, **exul,** literally meaning "an exile", "in allusion to the fact that the original habitat is unknown, though there is every possibility that it will be found in some part of northern Mexico" [2] This species has proved to be extremely hardy in Texas and has also withstood occasional severe temperatures in New Orleans, the only Louisiana town in which I have seen it. It is adapted to the entire Gulf Coast.

The distinctive characters of the Victoria palmetto (Fig. 63) in contrast to the cabbage palmetto may best be observed at St. Bernard Circle, where trees of both species of similar age are growing together. When I first noted these plants, I supposed they were all cabbage palmettos, although some the them **(S. exul)** were more robust than the others, having a thicker trunk with larger boots and deeper green, less filiferous leaves forming a heavier, more open crown. This sturdy appearance characterizes the Victoria palmetto. However, the fruits and flowers distinguish it botanically.

This is one of the larger-fruited species; the shining, dark brown "berries", about 3/4 inch in diameter, are nearly spherical and each shows a distinctly visible, small, pointed spike (the remains of the style) at the base. The fruits are scattered on the branches of a vigorous, somewhat angular spadix, slightly shorter than the leaves. The branches are fewer in number, stronger, and more widely spaced than in the cabbage palmetto (Fig. 64).

Victoria palmetto becomes 35 ft. or more tall and has a trunk diameter of about 18 inches. One specimen on the Stauffer property in Audubon Place, New Orleans, is of this height. It was introduced by Mr. Lowe in 1901 and is about 50 years old. The boots have a tendency to remain partially attached for some time; when they gradually slough off, the bark is rather rough and the indistinct leafscars are comparatively widely spaced. The leafbases begin to separate into halves very early; perhaps that is the reason their split margins are exteremely fibrous, so much so that the mattula within the crisscross is hardly noticeable.

The 98 primary segments, narrowed at the tips, cut the leafblade inwards from less than one-half in the upper portion to more than two-thirds at the sides. Fig. 65 illustrates the leaf division, the platelike hastula with recurved margins, and the upper part of the petiole. The petioles exceed the blades and are about twice as wide at the base as those of the cabbage palmetto.



■ **Fig. 64. Spadix in fruit. (S. EXUL). Cut from tree shown in Fig. 63.**

An "Old Timer" Tells About Hunting in the Good Old Days

By L. N. Hatry

The "Mallard", or "Old Green Head", as it is more familiarly known in Louisiana, was the name of a small hunting camp located on the banks of Spanish Canal, at its head. This small Canal runs into River Chene (or Oak River), and in reality is only one of the many smaller bayous of Louisiana which finally wind their serpentine way, through Plaquemines Parish in the Southern part of the Pelican State, into the Gulf of Mexico.

The idiosyncrasies of the duck hunter, which are many, came nearer to being satisfied in this spot than anywhere else, since it was the nearest place to the much talked of "Hunter's Paradise" that could be found.

About an hour and three quarters' paddling by pirogue brought us, through the most typically picturesque Louisiana swampland, from the Camp at the head of the Canal to its mouth leading into River Chene. The old cypress trees, bespeaking the past many thousand years, spread their large limbs which were festooned with silvery gray Spanish moss and, in places, covered the entire canal. Leaving this, the Canal wound through a small ridge whose luxuriant growth of palmettoes and other dense foliage gave us the impression of passing through an impenetrable jungle. After this, the open country or prairie was encountered, and just another hard paddle brought us to that magical spot we had heard of so often from the natives living in those parts—River chene greeted us with wide open arms, and bade us welcome to its many marvelous lagoons in which were found in great numbers the aristocratic mallards and lordly pintails waiting to appease the duck hunter's desire to bag them; but we were yet to experience the greatest thrill of all—namely, that of holding post mortems at the evening round up over a steaming cup of dripped black coffee:

So, one Sunday morning in November, dawn broke at 6 a. m. and, although all signs of the previous night had pointed to a wonderful duck weather, (according to the old timers), contrary to predictions it was raining much too hard to leave camp; therefore, once again the followers of Izaak Walton indulged in their fafavorite indoor sport of telling about their wonderful hunting trips of the past, rather than go back to bed. It looked as if the day was lost, but an old duck hunter, who knew not what disappointment meant, suggested that we wait and make an afternoon hunt into the promised land.

Leaving camp at 12 noon, after the rain and northwester had subsided and the mercury stood at 36°, we reached River Chene and picked up the professional guide who was to lead us to the lagoon; build the blinds and arrange the decoys. All set for the opening shot, we were finally rewarded with as many ducks as we cared to carry away. The guide, who made his living shooting for the northern market, stood dumbfounded when we would shoot at a single bird. It was awful in his opinion to waste so much ammunition, but what could be expected of amateurs. He, (the professional guide), shot a double barrelled shotgun, using only black powdered shells and never wasting one of them on a single bird, but always lining up two or three before he would think of pulling the trigger, and rarely ever missing. It was a remarkable sight in that same lagoon to witness the shooting of duck by the professional. We were at a distance sufficiently far away to see the duck fall first; then we saw the flame caused by the explosion of the powder and, next, heard the report of the discharged shell. At first we wondered why the bird seemed to make a nose dive, and then were rudely reminded of what had happened by the report.

As it was then nearing dusk, we decided it was time to leave; called the guide and were soon campward bound. However, our guide extended us the hospitality of his abode and invited us to partake of some hot, fresh dripped coffee, as is customary amongst the natives living there. To them their Café Noir (black coffee) is a ritual and should be partaken of regardless.

Our host's abode was the most primitive affair that could possibly have existed so close to civilization, being constructed of dried palmetto leaves, which

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[2] Cook, O. F. "A new ornamental palmetto in southern Texas". U. S. Dept. Agr., Bur. Pl. Ind., Circ. No. 113. Feb. 15, 1913.

National Parks and New World Idealism

by
Arno B. Cammerer*

The recreational resource is not something that stands apart from the other resources; it is composed of them and is usually the total of them all. When it is conserved and utilized properly, there is strong probability that all the component resources are treated properly. Likewise, when the component resources have been squandered, the recreational resource has vanished. Recreational utility is rightly becoming the criterion of good land management, and parks are strongly indicated as the apex of a national conservation program.

Parks are not a type of scenery; they are a type of public reservation. That type of reservation could be applied to an acre of grassland in the plains as well as to an acre of mountain summit in the Andes or the Rockies. Park standards refer therefore, not to the kind of natural scenery that may be selected for park status, but to the use that is made of it . . . .

No matter what type of physiography may be chosen, or what biologic, geologic, historic, or archeologic exhibit, the purposes are the same: the areas are set apart to be preserved and enjoyed without impairment. While the 158 reservations in the national park system are grouped into 11 descriptive categories—such as parks, monuments, historical parks, historic sites, battlefield parks, memorials, etc.—they are all the same type of reservation. Generically all are parks.

When someone attempts to break through one of these reservations and exploit its resources for private gain, that is a threat to park standards and should be a matter of public concern. Such attempts usually are piecemeal, and each is made by its proponents to appear reasonably insignificant. But the parkman knows from hard experience that all such invasions are cumulative, and that the toxin, if permitted, will in time become lethal.

In the national parks we are trying to preserve the land whole, not that human use of the areas should be subordinated to nature protection, and not that in the parks we think more of wildlife or other objects than of people. Parks are for the people to use and there is no other reason for their existence. But, if a car is to transport us, we must keep its mechanism in running order. If parks are to serve us we must protect their natural machinery . . . .

Recognizing these facts in our plans and developments, we can increase the utility of our parks, and if our feet are on the ground, we can develop almost any kind of park. To do so, however, our purposes must be clearly in mind. These statements seem obvious, but in fact they are not. There is frequent conflict between parkmen, one faction charging that the other would lock up the parks and keep people out of them, the other asserting that the first would make city playgrounds of all parks. Would not both factions be nearer the truth if they agreed that there is no conflict—that we should, so to speak, render to Caesar the things that are Caesar's and to God the things that are God's? That we should not try to treat Jones Beach as we would the back country of Yellowstone or make Yellowstone serve as Jones Beach? Countless thousands may play on the beach and the tide comes and washes their tracks away. Countless thousands trampling the roots and packing the soil around a giant Sequoia tree will kill the tree that they come to see. Both the wilderness park and the heavily used beach have their places, and there is no legitimate conflict between them. Management of any park must partake of common sense and good taste so that development will not defeat the purpose for which it was established and that purpose will not be confused with the purpose of some other park.

Park management is more, of course, than common sense and good taste. It is a profession and a career in actuality, and the time is ripe for its techniques to be professionalized academically. The breadth of its activities, its intense absorption with people and nature, its concern with the physical evidences of history and prehistory, their preservation and interpretation, the host of practical skills required in construction, operation and maintenance and the ever-quiding objective of preserving the best and making it available—all these make the park profession one of the most attractive stimulating of all careers.

If lands are no longer good for one use, it seems only common sense that we put them to another use. If lands are no longer needed for growing timber, for instance, or for some other industrial purpose, and they are of outstanding scenic and recreational character, would it not be simple wisdom to reserve them for recreation? The answer would be in the affirmative more often if it were not that there is a widespread tendency to try to do too many things for too many people on every acre of public land.

This policy is referred to as a multiple use. Under it we are told that the resources of a proposed park are so interwined and are of such great importance that the only way the area can be properly managed is to use all the resources simultaneously and equally, and, that if this is done, the recreational resource will receive full consideration along with the rest.

Multiple use is a common, and often a good, feature of land management. As it is commonly accepted, however, it means the specific brand of land management that I have described, which sets multiplicity as its objective and permits a mediocre rating of every resource in a given area.

Nobody could have any quarrel with multiple use as a descriptive term, provided it is only an incidental aspect of optimum use. A national park, for instance, which the multiple use exponents usually refer to as a single use form of land management, actually may provide several uses. It may provide vital watershed protection; serve as a wildlife sanctuary, as a natural and historic museum and place of public education; it may serve as a source of employment for local labor and a market for local products; increase the value of adjacent and tributary property, and, at the same time, serve as a stimulus to national and inter-

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* Former Director, National Park Service.

VIEWS AND COMMENTS ON THE REVIEW

Harry C. Oberholser, Washington, D. C.

"The best State Conservation Magazine in the United States."

Miss Esther Crifase, New Orleans, La.

"Grand, the only magazine of this sort that really is interesting enough to read from cover to cover."

H. L. Cessac, Beaumont, Texas.

"I have never seen any other publication of its kind that came up to this magazine."

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Hamilton W. Dunshie, Rita, La.

"The Louisiana Conservation Review is such an interesting book and a valuable asset to school teachers that copies should be made available to all school libraries for reference books."

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C. O. Stroud, Weeks, La.

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Lillian G. Chiowitz, Chicago, Ill.

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A. R. Campbell, Shreveport, La.

"A splendid publication of much value in advertising the State."

Editor's Note—In the last issue of the Review, there was enclosed a card asking our readers several questions. The main purpose of the questionnaire was to obtain corrections in names and addresses on our mailing list in order to bring it up to date. One of the questions asked was, "What is your opinion of the Louisiana Conservation Review?"

Of the approximate 27,000 circulation of our last issue, the response to the questionnaires totaled about 50 per cent. On this page is presented some of the views and opinions from our readers from all parts of the country selected at random from over 13,000 questionnaires and letters received during the past several weeks.

W. H. T. Baillie, Department of Biology, University of Toronto, Ontario, Canada.

"Good. It is of general interest and also of interest to research workers in the Ontario Fisheries Research Laboratory to whom I turn the copies over after reading."

Mrs. Martha Cole, Bossier, La.

"I just could not teach Louisiana Geography and History without it."

W. E. Scofield, State Fisheries Laboratory, Terminal Island, California.

"More attractive and of wider reader interest than any other of the state magazines of this country."

Jack Asken, Route 2, Quitman, La.

"I think the magazine is very well planned and that it contains articles of deep interest regarding Louisiana and its natural resources."

J. H. Hoeppel, Editor National Defense, Arcadia, California.

"In my opinion it is one of the best advertising medium I have seen from any state. And what is more, it makes even a Californian envious of your good state."

John W. Trotter, Star Route, New Iberia, La.

"I think it an excellent magazine and a wonderful way of bringing citizen's attention to the state's assets."

Jack E. Harris, Shreveport, La.

"The Louisiana Conservation Review is an asset to our State. Every Louisianian should be proud of it."

R. Downes, Jr., Monroe, La.

"It is splendid and I wish everyone in America could receive it."

John B. Entrikin, Centenary College, Shreveport, La.

"My entire family enjoy the Review, and profit by reading it."

S. N. Chennault, Gilbert, La.

"I think the magazine a well written and graphic means of showing to the world something of our wonderful natural resources and meets a long felt need."

L. A. McKnight, East Point, La.

"The most beneficial of any state magazine."

Mrs. A. G. Wallace, St. Louis, Mo.

"You are doing an excellent job at teaching conservation. Every state needs a similar publication."

F. B. Plummer, Bureau of Economic Geology, Austin, Texas.

"Excellently composed and written and of distinct popular appeal."

W. A. Blase, St. Louis, Mo.

"I think it is really worthwhile publication. I wish we had one in our state."

J. J. Cubuss, RFD, Simmsboro, La.

"I think there is no better paper or magazine published."

G. H. Allen, Yarmouth, Nova Scotia.

"Interesting, instructive and educational to one who is so unfamiliar with your section of the country. An attractive publication."

Oil and Gas Wells Completed in South Louisiana During 3rd Quarter of 1940

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Gravity	Total Depth
ANSE LA BUTTE (St. Martin Ph.)	Glassell & Glassell	A. Moresi Oil Co. #2	7/4/40	324.48	12/64	36.7	4,588
	Stanolind Oil & Gas Co.	D. Bergeron #1	7/9/40	128.64	3/16	37.4	3,443
	O. W. Dyer, Sr.	F. N. Patrick et al. #1	7/18/40	206.00	1/4	36.7	3,695
	Glassell & Glassell	M. Breaux #3	7/23/40	259.32	12/64	38.7	4,522
	Crosby Drilling Co.	Republic Prod. Fee #1	8/1/40	356.04	3/16	37.0	4,743
	Stanolind Oil & Gas Co.	Celestine Bergeron #1	8/1/40	369.92	3/16	37.6	4,845
	Crosby Drilling Co.	Republic Prod. Fee #2	9/17/40	414.00	12/64	38.6	4,783
	Glassell & Glassell	M. Breaux Est. #4	9/18/40	332.00	10/64	38.9	4,972
	Stanolind Oil & Gas Co.	Leon J. Dupuis #1	9/27/40	369.84	12/64	38.5	4,728
BANCROFT (Beauregard Ph.)	Republic Production Co.	Columbia L&T Co. #19	7/26/40	193.00	3/16	42.8	7,330
BARATARIA (Jefferson Ph.)	The California Co.	Fleming Plantn. #1	7/25/40	315.60	10/64	37.0	8,797
	Carter-Perrin & Brian and The California Co.	Ruttley-Wiseman-Pizani Com. #2	8/1/40	168.00	1/8	37.0	8,225
	Carter-Perrin & Brian	Westfeldt-Penniman #1	8/11/40	243.42	5/32	36.9	8,245
	The California Co.	Community Unit B-2	9/2/40	316.14	5/32	36.5	8,773
	The California Co.	Fleming Plantn. A-6	9/17/40	308.37	5/32	36.5	8,304
BAYOU BLUE (Iberville Ph.)	Markley & Crosby Drlg. Co.	Baist Cooperage #3	7/13/40	170.46	16/64	18.0	1,602
	Markley & Crosby Drlg. Co.	Baist Cooperage #2	7/22/40	50.00	Pumping	18.0	3,695
	Superior Oil Co.	Schwing L&S Co. #4	7/23/40	170.10	9/64	29.2	6,428
	Superior Oil Co.	Schwing L&S Co. #3	8/9/40	172.00	9/64	32.0	5,100
	Markley & Crosby Drlg. Co.	Baist Cooperage #4	8/25/40	186.66	16/64	19.8	1,772
BAYOU BOUILLON (St. Martin Ph.)	Transcontinental Pet. Co.	State #6	7/20/40	211.44	12/64	22.7	3,512
BAYOU CHOCTAW (Iberville Ph.)	Louark Producing Co.	Gay Union #9	7/26/40	100.00	3/16	30.0	5,578
BAY ST. ELAINE (Terrebonne Ph.)	The Texas Company	State-Bay St. Elaine B4	7/29/40	258.72	3/32	32.7	8,910
CAMERON MEADOWS (Cameron Ph.)	Magnolia Petroleum Co.	Cameron Meadows #28	8/17/40	518.28	1/4	30.1	6,943
CHACAHOULA (Lafourche Ph.)	Sun Oil Company	Dibert-Stark-Brown #8	7/20/40	292.08	3/16	33.5	6,494
CHALKLEY (Cameron Ph.)	Humble Oil & Rfg. Co.	K. B. Hanszen #9	6/23/40	1 MCF* (Gas)	1/8	.....	8,694
	Shell Oil Company, Inc.	Sweet Lake L&O Co. #2	7/13/40	779.04	1/4	37.3	8,891
	Humble Oil & Rfg. Co.	K. B. Hanszen #11	7/16/40	388.80	1/4	36.5	8,623
CHARENTON (St. Mary Ph.)	Pan American Prod. Co.	E. J. Robichaux #21	7/13/40	49.68	Gas Lift	19.2	1,260
	Pan American Prod. Co.	E. J. Robichaux #22	7/21/40	66.24	Gas Lift	19.5	1,115
	St. Mary Oil Co.	H. Robichaux #7	7/27/40	165.60	Pumping	20.7	1,154
	Pan American Prod. Co.	E. J. Robichaux #23	7/30/40	40.28	Gas Lift	20.3	1,129
	St. Mary Oil Co.	Blanchard #7	8/20/40	132.48	Pumping	22.4	1,152
	Pan American Prod. Co.	Veeder-Hunt et al. #2	8/29/40	198.72	16/64	22.7	2,710
CHENEYVILLE (Rapides Ph.)	Amerada Petroleum Corp.	Weil Co. Inc. #11	7/8/40	355.00	3/16	37.8	5,715
	Sid W. Richardson	Weil Co. Inc. #14	7/28/40	340.80	3/16	37.2	5,752
	Amerada Petroleum Corp.	Weil Co. #12	8/14/40	261.00	3/16	47.0	5,747
	Amerada Petroleum Corp.	Weil Co. Inc. #13	9/24/40	260.28	3/16	46.0	5,740
	Sid W. Richardson	Weil Co. Inc. #15	9/30/40	502.00	3/16	37.3	7,968
CHINA (Jefferson Davis Ph.)—Discovery Well.	Union Sulphur Company	Calcasieu Ntl. Bank A1	8/26/40	40.50	14/64	50.0 Dist.	9,386
DARROW (Ascension Ph.)	Humble Oil & Rfg. Co.	Humble Comm. #30	9/21/40	292.12	12/64	29.1	4,743
DELTA FARMS (Jefferson Ph.)	The Texas Company	State-Bayou Perot #1	9/28/40	747.00	1/4	34.6	11,379
DOG LAKE (Terrebonne Ph.)	The Texas Company	State-Dog Lake #24	9/6/40	178.00	3/16	33.8	7,817
EAST HACKBERRY (Cameron Ph.)	The Texas Company	St.-East Hackberry #30	7/12/40	146.04	1/4	29.5	7,437
	Harrison & Abercrombie	Edmund Verdine #3	9/11/40	473.00	16/64	30.3	7,266
EDGERLY (Calcasieu Ph.)	Emerson Oil Corp.	Hunter Co. Inc. #15	9/20/40	232.20	1/4	25.9	3,614
ENGLISH BAYOU (Calcasieu Ph.)	Union Sulphur Company	O. H. Castle #12	7/24/40	140.28	10/64	40.4	7,050
EOLA (Avoyelles Ph.)	Amerada Petroleum Co.	S. Cerami #5	7/7/40	275.88	3/16	34.0	6,450
	George E. Lilly	L. B. Dent #2	7/17/40	163.00	3/16	45.0	8,582
	Lake & Bass	Ritchie Wh. Gro. #3	7/22/40	357.00	3/16	44.0	8,575
	Amerada Petroleum Corp.	Mrs. C. B. Marchive #10	8/1/40	292.00	3/16	37.0	6,450
	Gulf Refining Co.	Mouliere #5	8/8/40	349.00	3/16	44.4	8,555
	Sid W. Richardson	Est. of Sam Haas #2	8/9/40	137.88	5/32	44.0	8,620
	Gulf Refining Co.	M. F. Mouliere #6	9/21/40	325.00	3/16	43.10	8,560
GARDEN ISLAND BAY (Plaquemines Ph.)	The Texas Company	State-Gdn. Isl. Bay #47	7/22/40	497.20	3/16	35.4	5,597
	The Texas Company	State-Gdn. Isl. Bay #46	7/31/40	454.96	12/64	39.7	4,453
	The Texas Company	State-Gdn. Isl. Bay #48	9/23/40	227.04	5/32	35.3	5,915
GIBSON (Terrebonne Ph.)	Shell Oil Company, Inc.	Pelican #9	7/17/40	861.00	16/64	37.7	9,516
	Shell Oil Company, Inc.	R. E. Kuntz #4	8/23/40	392.00	10/64	37.7	9,513
GOLDEN MEADOW (Lafourche Ph.)	The Texas Company	Falgout #14	7/6/40	422.88	12/64	37.3	7,937
	Mar-Tex Oil Corp.	Rebstock Comm. D-2	7/11/40	122.00	9/64	36.0	5,175
	Brown Woods Oil Corp.	Est. of Adrian Lefort #1	7/12/40	111.00	12/64	36.0	5,615
	The Texas Company	Falgout #16	7/12/40	195.00	10/64	36.0	5,175
	The Texas Company	LLE-Golden Meadow #13	7/12/40	412.00	12/64	37.6	7,207
	Berkshire Oil Company	Joe Nicol et al. #15	7/19/40	170.00	12/64	36.5	5,705

Oil and Gas Wells Completed in South Louisiana During 3rd Quarter of 1940

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Grav-ity	Total Depth
GOLDEN MEADOW (Lafourche Ph.)							
	F. P. Dayvault	Gillis Lee #1	7/25/40	160.00	9/64	36.0	5,684
	Marr & Vaughn	B.&D. Unit #3	7/30/40	240.00	12/64	38.3	11,011
	Brown Woods Oil Corp.	Adrien Lefort #2	8/1/40	192.00	8/64	36.0	5,220
	The Texas Company	State-Catfish Lake #8	8/2/40	130.00	10/64	27.6	2,800
	O'Dwyer Oils Inc.	Lafourche Rlty. Co. #5	8/4/40	240.00	10/64	36.0	5,503
	The Texas Company	Falgout #17	8/5/40	248.88	10/64	36.0	5,175
	Temple Hargrove	School Board #2	8/6/40	108.00	11/64	36.0	5,490
	The Texas Company	Falgout #15	8/10/40	292.00	10/64	38.1	7,940
	Berkshire Oil Company	Authement #1	8/12/40	384.00	15/64	38.5	10,453
	The Texas Company	LLE-Golden Meadow #12	8/18/40	358.00	10/64	36.4	11,161
	F P. Dayvault	Gillis Lee #2	8/20/40	225.00	10/64	36.0	5,219
	Jim McMurray Prod. Co.	Jack Collins #2	8/23/40	130.00	8/64	36.0	5,500
	George L. O'Dwyer	Lafourche Rlty. Co. #6	9/2/40	192.00	12/64	36.0	5,176
	The Texas Company	LLE-Golden Meadow #17	9/4/40	184.00	10/64	36.5	5,664
	Tippett Oil Corp.	Gracian Curol #1	9/7/40	170.00	9/64	36.0	5,480
	Bateman Drilling Co.	Theodore Collins #1	9/16/40	93.00	16/64	36.0	5,455
	Brown-Woods & Co., Inc.	St.-Bayou Lafourche #5	9/17/40	192.00	12/64	36.0	5,492
	F. P. Dayvault	C. & C. Meyer #1	9/20/40	145.80	10/64	35.5	5,503
	The Texas Company	LLE-Golden Meadow #16	9/27/40	336.40	12/64	36.5	8,790
	Tippett Oil Corp.	G. Curol #2	9/29/40	93.00	8/64	36.4	5,200
GRAND BAY (Plaquemines Ph.)							
	Gulf Refining Co.	La. State "QQ" #8	7/10/40	292.00	5/32	35.7	8,112
	Gulf Refining Co.	GPLD A-9	8/25/40	408.00	3/16	34.4	8,112
	Gulf Refining Co.	GPLD A-10	8/31/40	779.00	1/4	36.2	8,787
GRAND LAKE (Cameron Ph.)							
	Superior Oil Co.	Grand Lake-State #14	7/6/40	251.52	9/64	33.1	8,990
	Amerada Petroleum Corp.	Mallard Bay-State #7	7/15/40	299.88	5/32	32.9	9,000
	Superior Oil Co.	Grand Lake-State #15	8/21/40	324.60	10/64	32.7	8,970
HORSESHOW BAYOU (St. Mary Ph.)							
	The Texas Company	St. Mary Ph. Ld. Co. #4	9/7/40	356.40	10/64	38.1	10,887
IBERIA (Iberia Ph.)							
	William Helis, Jr.	Sabatier H-1	7/15/40	61.85	7/32	19.6	1,321
	George J. Helis	Gulf Fee 1-A	7/19/40	324.00	14/64	32.8	7,048
	The Texas Company	L. P. Bryant #7	7/29/40	64.80	Pumping	23.3	3,859
	Lisbon-Iberia Oil Corp.	Gulf Fee #9	8/14/40	291.60	1/4	24.0	3,801
	The Texas Company	J. P. Duhe et al. #18	8/17/40	211.60	12/64	30.6	3,858
	Lisbon-Iberia Oil Corp.	Gulf Schwing Goodwin #10	8/28/40	138.08	1/4	37.1	3,905
	Plymouth Oil Company	Lillian LeBlanc #1	9/5/40	518.40	1/4	35.8	8,090
JENNINGS (Acadia Ph.)							
	Port City Oil Company	Jennings-Heywood #22	7/4/40	97.50	Pumping	23.0	2,023
	Shell Oil Company, Inc.	Conover Comm. #11	7/15/40	356.40	12/64	38.3	7,727
	Imperial Oil Company	Heywood 2-A	7/17/40	45.00	Pumping	24.0	1,748
	Welch & Robinson	Houssiere-Lat. #1	7/27/40	24.74	Pumping	25.0	2,046
	Stanolind Oil & Gas Co.	Crowley O&M Co. #118	7/30/40	168.18	3/16	33.4	7,595
	Stanolind Oil & Gas Co.	Houssiere-Lat. #20	9/15/40	287.04	1/4	31.8	7,550
LAFITTE (Jefferson Ph.)							
	The Texas Company	LLE-Lafitte #17	7/3/40	720.72	1/4	37.6	10,187
	The Texas Company	Leo A. Marrero #6	7/7/40	136.40	16/64	25.2	10,146
	The Texas Company	Madison Rlty. Co. A-8	8/20/40	834.32	1/4	37.9	10,200
	The Texas Company	Madison Rlty Co. A-7	8/23/40	623.00	1/4	37.4	10,144
LAFOURCHE CROSSING (Lafourche Ph.)							
	M. T. Grubb-H. L. Hawkins	G. H. Stickney-Thibodaux Heirs #1	7/11/40	160.00	16/64	46.8Dist.	10,154
	Mikton Oil Company	Martinez #4	9/27/40	304.00	16/64	40.2	10,130
LAKE LONG (Lafourche Ph.)							
	Fohs Oil Company	State-Lake Long #12	9/14/40	138.00	10/64	38.8	9,365
LAKE SALVADOR (St. Charles Ph.)—Discovery Well							
	The Texas Company	St.-Lake Salvador #1	9/15/40	840.00	1/4	33.7	10,500
LEEVILLE (Lafourche Ph.)							
	The Texas Company	LLE-Leeville #74	8/28/40	206.00	3/16	41.3	8,600
	The Texas Company	LLE.-Leeville #75	9/27/40	372.24	3/16	40.4	8,600
LITTLE CHENIER (Cameron Ph.)							
	Phillips Petro. Corp.	Miami Corp. #1	7/10/40	129.84	1/4	47.3	10,655
LOCKPORT (Calcasieu Ph.)							
	Magnolia Petro. Co.	Geo. W. Farquhar #11	9/11/40	90.00	12/64	32.0	6,620
NEALE (Beauregard Ph.)							
	Atlantic Refining Co.	Musser-Davis Ld. Co. #1	7/8/40	271.83	13/64	37.7	8,430
	Atlantic Refining Co.	Rice Ld. & Lbr. Co. #B2	7/21/40	432.00	1/4	40.1	8,411
	Atlantic Refining Co.	Kay Unit #1	8/26/40	271.68	1/4	38.0	8,447
	Atlantic Refining Co.	D. A. Whitmer #2	9/2/40	462.48	1/4	38.3	8,427
	Atlantic Refining Co.	Ira Spiers #2	9/6/40	431.64	1/4	38.1	8,434
NORTH CROWLEY (Acadia Ph.)							
	Humble Oil & Rfg. Co.	H. J. Thevis #3	7/19/40	719.28	1/4	35.3	8,800
	Humble Oil & Rfg. Co.	P. J. Reiners #2	7/23/40	503.13	1/4	35.0	8,600
	Humble Oil & Rfg. Co.	J. B. Stokes #3	8/16/40	746.58	1/4	35.0	8,860
	Vincent & Welch	Harmon Heirs #1	9/2/40	722.16	1/4	36.0	8,836
NORTH ELTON (Allen Ph.)							
	Bel Oil Corporation	Bel Oil Corp. #2	7/21/40	81.24	1/4	58.4	7,654
PARADIS (St. Charles Ph.)							
	The Texas Company	Sunset R&P Co. #1	7/23/40	54.80	5/16	61.0Dist.	11,246
	The Texas Company	LLE-Paradis #5	8/1/40	843.24	1/4	37.5	11,190
PORT BARRE (St. Landry Ph.)							
	The Texas Company	Botany Bay #29	7/5/40	730.80	1/4	37.0	6,148
POTASH (Plaquemines Ph.)							
	Gulf Refining Co.	Orls-Levee Brd. #45	9/6/40	389.52	12/64	28.7	8,000
QUARANTINE BAY (Plaquemines Ph.)							
	Gulf Refining Co.	La. State "QQ" #19	7/16/40	763.00	16/64	34.9	8,190
	Gulf Refining Co.	La. State "QQ" #18	7/17/40	779.00	16/64	34.5	8,571
RACELAND (Lafourche Ph.)							
	Amerada Petro. Corp.	South Coast #6	8/12/40	130.00	1/8	38.5	10,259
	Amerada Petro. Corp.	Mrs. J. P. Moore #1	9/25/40	150.00	5/32	36.4	9,780

Oil and Gas Wells Completed in South Louisiana During 3rd Quarter of 1940

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Gravity	Total Depth
SOUTH CROWLEY (Acadia Ph.)	Humble Oil & Rfg. Co.	Michel Leger #1	9/2/40	681.60	1/4	36.0	7,612
SOUTH JENNINGS (Jefferson Davis Ph.)	Stanolind Oil & Gas Co.	E. K. Atwell #1	5/20/40	16.08	1/8	54.0	9,652
	Stanolind Oil & Gas Co.	W. H. Adams #1	6/12/40	16.08	1/8	54.0	9,606
STARKS (Plaquemines Ph.)	Lutcher & Moore Lbr. Co.	Lutcher-Moore #6	8/1/40	111.12	7/32	22.4	4,467
	Lutcher & Moore Lbr. Co.	Lutcher-Moore #7	8/19/40	156.70	7/32	41.4	5,021
STELLA (Plaquemines Ph.)—Discovery Well	The California Company	Delta Min. #5 Ls. #1	8/9/40	487.00	3/16	41.5	10,198
SWEET LAKE (Cameron Ph.)	The Pure Oil Co.	Yount Lee Oil Co. #18	7/27/40	360.00	14/64	27.2	7,856
UNIVERSITY (East Baton Rouge Ph.)	Sugar Field Oil Co.	Lerner Comm. #1	7/14/40	289.80	10/64	34.6	6,797
	Sugar Field Oil Co.	Nicholls Comm. #3	8/2/40	263.64	10/64	34.6	6,815
	Sugar Field Oil Co.	Griffith #1	8/24/40	288.60	10/64	34.7	6,824
	Sugar Field Oil Co.	Harry Nelson #1	9/28/40	282.54	10/64	34.7	6,812
VALENTINE (Lafourche Ph.)	C. I. Drilling Company—Mohawk Corp.	Dousson #2	6/12/40	526.00	12/64	37.6	7,019
	William Helis et al.	Valentine #7	8/1/40	259.20	10/64	40.3	7,568
VENICE (Plaquemines Ph.)	Tide Water Associated Oil Company	Buras Levee Dist. #8	7/25/40	176.00	1/8	39.3	10,650
VILLE PLATTE (Evangeline Ph.)	Continental Oil Company	A. Coreil #4	7/4/40	360.00	1/4	40.6	10,251
	Continental Oil Company	Opel-St. Landry Sec. #8	7/15/40	399.60	1/4	42.2	9,078
	Continental Oil Company	Ed Tate Tr. 2 #1	7/15/40	60.00	1/4	63.2 Dist.	8,942
	Continental Oil Company	A M Fontenot Tr. 2&3 #8	7/16/40	240.00	1/4	54.6	9,015
	Amerada Petro. Corp.	L. O. Roherie #2	7/18/40	503.00	1/4	40.0	10,253
	Continental Oil Company	W. L. Tate #5	7/26/40	720.00	1/4	53.0	10,240
	J. K. Hughes Oil Company	Oscar Petre #1	8/4/40	276.00	1/4	56.8	10,206
	Continental Oil Company	J. E. Ludeau Tr. 3 #1	8/25/40	402.00	1/4	39.4	10,230
	Continental Oil Company	A. Coreil #5	8/26/40	708.00	1/4	36.2	10,271
	Continental Oil Company	W. L. Tate #6	8/27/40	240.00	1/4	54.6	10,152
	Danciger Oil & Rfg. Co.	N. H. Hirsch #1	8/27/40	726.00	1/4	41.0	10,192
	Continental Oil Company	A. M. Fontenot Tr. 2&3 #9	9/1/40	603.60	1/4	40.6	9,045
	Continental Oil Company	J. E. Vidrine Tr. 14 #3	9/8/40	660.00	1/4	40.6	10,222
	Continental Oil Company	A. M. Fontenot Tr. 5 #2	9/20/40	456.00	1/4	41.2	8,974
WEST COTE BLANCHE BAY (St. Mary Ph.)	The Texas Company	St. WCote Blanche Bay #2	7/19/40	324.00	11/64	29.0	9,491
	The Texas Company	St. WCote Blanche Bay #4	8/21/40	243.00	13/64	28.5	5,014
WEST HACKBERRY (Cameron Ph.)	Superior Oil Company	D. Kaough et al. #2	7/2/40	372.60	1/4	39.3	8,340
	Stanolind Oil & Gas Co.	School Board B22	8/20/40	373.08	5/32	31.3	9,865
	Superior Oil Company	Raymond Vincent #3	8/27/40	234.84	12/64	42.9	9,164
WEST LAKE VERRET (St. Martin Ph.)	Shell Oil Company, Inc.	Jeanerette L&S Co. #5	8/20/40	315.00	10/64	37.8	8,835
WEST MERMENTAU (Jefferson Davis Ph.)	H. M. Naylor Oil Co.	Acadia Dev. Co. #1	7/30/40	44.58	3/16	58.0	10,003
WHITE CASTLE (Iberville Ph.)	Shell Oil Company, Inc.	Forest Home #2	7/8/40	667.98	16/64	27.9	6,481
	Shell Oil Company, Inc.	A. Wilbert's Sons #17	9/8/40	384.00	16/64	26.4	6,600
WHITE LAKE (Vermilion Ph.)—Discovery Well	Union Oil Co. of Calif.	W. White Heirs #1	7/11/40	227.00	1/4	34.6	11,098
WOODLAWN (Jefferson Davis Ph.)	Union Sulphur Company	E. Miller #1	7/12/40	96.24	17/64	40.8	9,750
	Union Sulphur Company	M. F. Johnson #4	8/31/40	282.00	8/64	36.8	8,118
	Union Sulphur Company	Calcasieu Ntl. Bank #6	9/2/40	481.56	1/4	33.1	9,553

National Parks and New World Idealism

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national travel, which in turn stimulates a host of other industries. All these are incidental to the dominant use of the land for recreation. In such case, the optimum use of the land includes several uses, but multiplicity is not the objective: it is an incidental, and even accidental, aspect.

I sincerely believe that the exponents of multiple use really have optimum use in mind, and that they have no thought but that the natural resources should be appraised with intelligent selectivity. If that is the case, then we should recognize it by all means and admit that we do not hold multiple use either as a formula of land management or as an objective. Such action would revolutionize public land management. It would lead to the classification of lands according to their best uses. It would mean, for example, as G. A. Pearson says, that "Livestock production like timber production would profit immensely, if instead of trying to utilize all lands regardless of quality, the range industry were concentrated on lands really suited to it by climate, soil, and water facilities." It would mean that a national conservation program, insofar as the public lands are concerned, would be rational and flexible and that recreational lands would be classified as recreational lands rather than as forest or range or some other category for which they are largely useless. It would mean, in time, that lands classified according to their dominant use would be managed by agencies especially skilled in providing those uses, and that incidental uses would be permitted in accordance with their relative importance.

In such a conservation program there might be more parks or there might not be, depending upon the classification of the resources. It might be found that recreational areas, so classified for their dominant use but subject to certain subordinate uses, would be a useful complement to the park systems. Such areas would be more apt to retain their distinguishing characteristics, and to render their maximum usefulness, if they were so recognized, but parks would remain the apex of the conservation program because they are the irreducible treasures.

Oil and Gas Wells Completed in North Louisiana During 3rd Quarter of 1940

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Gravity	Total Depth
BULL BAYOU (Red River Ph.)							
	The Texas Company	Z. K. Brinkeroff B-37	8/23/40	4.67	Pumping	41.5	2530
BULL BAYOU (De Soto Ph.)							
	Roy Reese	E. Harp #1	9/19/40	25.00	Open	40.0	2726
CADDO (Caddo Ph.)							
	Sloan Wells	A. Stiles #2	5/6/40	25.00	Pumping	42.0	2404
	Jos. G. Strahan	Stiles A-4	7/1/40	25.00	"	42.0	2368
	J. W. Brown	Geo. E. Wells #3	7/5/40	25.00	"	....	1708
	L. L. Sugar	Muslow B-2	7/5/40	30.00	"	28.0	1557
	The Texas Company	W. B. Noel B-23	7/5/40	151.00	"	......	1673
	R. B. Creager	Muslow Oil Co. #1	7/7/40	3.00	"	42.0	1569
	Milam Prod. Co.	Beckham #2	7/7/40	100.00	"	......	1540
	M. L. Miller	Muslow #1	7/7/40	50.00	"	......	1468
	Sklar Oil Corp.	Hobbs #4	7/7/40	70.00	"	36.0	1550
	Stanolind Oil & Gas Co.	Noel Est. Inc. #2	7/7/40	20.00	"	......	1556
	E. A. Stiller et al.	Stiles #4	7/10/40	6.00	"	42.0	2401
	Juan & McFatrich	Hobbs A-2	7/11/40	30.00	"	......	1578
	Chastain & Meier	Crystal Fee #1	7/13/40	25.00	"	21.0	1011
	The Texas Company	W. F. Noel B-24	7/15/40	70.00	"	......	1700
	G. A. White	Muslow Oil Co. #1	7/17/40	150.00	"	30.0	1550
	C. W. Crockett	Tobin et al #1	7/19/40	3.00	"	39.0	1531
	Magnolia Petro. Co.	Doan-Thigpen #23	7/24/40	100.00	"	......	1500
	Morris Co. & J. S. Laub	Caddo O&M Co. #2	8/1/40	100.00	"	39.0	1520
	C. Reele	Reele-Godfrey #1	8/1/40	75.00	"	40.0	1540
	Frank W. Bennett	Mrs. B. M. Askew #1	8/2/40	50.00	"	......	1550
	The Texas Company	A. Herndon #13	8/4/40	50.00	"	40.0	1640
	Geo. Mack et al.	Claude Stone #1	8/5/40	50.00	"	......	1520
	C. J. Brown	Ruben Glassell #1	8/8/40	15.00	"	40.0	1610
	W. C. Curry	Mrs. Kate Spell #1	8/8/40	15.00	"	39.0	1543
	Lloyd A. Farr	Stiles #6	8/10/40	25.00	"	19.0	1034
	Terrell H. Smith et al.	Handschumacher #1	8/13/40	240.00	1/4	42.0	1691
	Wm. A. Brown	Petro. Dev. Corp. #1	8/14/40	40.00	Pumping	42.0	1540
	Dhoury & Zwan	Nick George #1	8/16/40	40.00	"	40.0	1512
	Chas. Wampler	First Methodist Church #1	8/16/40	52.00	"	40.0	1530
	A. R. Hancock	Std. Oil Co. #9	8/22/40	1.50	"	40.0	1737
	Chas. L. Bacheller	Stallcup 1A	8/24/40	70.00	"	42.0	2520
	Claude Ferguson	C. W. Lane #1	8/24/40	60.00	"	44.0	1550
	Rowland Savage et al.	Mansfield Oil Co. A-4	8/26/40	20.00	"	40.0	1536
	Elbert E. Johnson	Petro. Dev. Corp. #2	8/27/40	31.00	"	40.0	1540
	W. B. Johnson Drlg. Co.	..Stiles #1	8/29/40	40.00	"	42.0	2445
	Pelham Oil Corp.	Bickham #4	8/29/40	67.00	"	41.0	1510
	Ce-Beth Oil Co.	J. Ober #2	9/2/40	12.50	"	42.0	2274
	Stanolind Oil & Gas Co.	Wm. Head "B" #1	9/3/40	7.00	"	40.0	1573
	James E. Kemp	J. Ober #1	9/7/40	39.00	"	40.0	1530
	Midfield Oil Co.	Muslow C-2	9/7/40	120.00	Open	40.0	1500
	Chas. Wampler	Newton #1	9/7/40	10.00	Pumping	......	1530
	Lloyd A. Farr	W. F. Stiles Est. #7	9/8/40	20.00	"	19.0	1028
	James E. Kemp	Caldwell #1	9/14/40	8.00	"	40.0	1780
	Magnolia Petro. Co.	Doan Thigpen #25	9/14/40	30.00	Open	40.0	1505
	R. C. McElmurry	John B. Files #1	9/14/40	50.00	Open	40.0	1555
	A. R. Hancock	Std. Oil Co. #10	9/15/40	500.00	1/4	40.0	1695
	Tiger Oil & Gas Co.	Crystal Fee B-2	9/16/40	8.00	Pumping	19.0	997
	Pelham Oil Corp.	Bickham #5	9/19/40	150.00	Open	......	1549
	Jos. W. Brown	M. L. Pitts #1	9/25/40	7.00	Pumping	40.0	1710
	W. C. Curry et al.	Mrs. Kate Spell #2	9/25/40	20.00	"	40.0	1545
	E. G. Hitchinson	Muslow Oil Co. #1	9/25/40	13.00	"	....	1589
	Steve Reele	Carl E. Brooks #1	9/25/40	4.00	"	40.0	1550
	R. B. Creager	Muslow #1	9/26/40	80.00	Open	40.0	1500
	Four Star Oil Co.	Muslow #3	9/26/40	35.00	Pumping	40.0	1550
	Southern Oil & Gas Co.	Muslow #4	9/26/40	80.00	Open	40.0	1525
	Juan & Fatrich	Hobbs #3	9/28/40	20.00	Pumping	......	1515
	Oil & Gas Inc.	Stiles #3	9/28/40	25.00	"	19.0	1945
	Davis & Hart	Muslow Oil Co. #3	9/29/40	100.00	"	40.0	1502
	E. O. Mitchell	Pickle #1	9/29/40	10.00	"	45.0	1563
COTTON VALLEY (Webster Ph.)							
	Hunt Oil Company	Stewart et al #6	7/6/40	235.29	3/8	61.5	8568
	Hunt Oil Company	Robert Scott #2	8/7/40	281.52	12/64	43.5	8735
	Hunt Oil Company	Crawford, Jenkins & Booth et al #1	9/23/40	283.14	11/64	47.9	8610
MONROE (Morehouse Ph.)							
	Southern Carbon Co.	Ten Delta #32	7/17/40	3-3/4 MCF*	(Gas)	......	2220
	United Carbon Co.	H. Anderson #2	8/29/40	1-3/4 MCF	"	......	2276
	United Carbon Co.	Crossett #5	9/26/40	1-1/2 MCF	"	......	2226
MONROE (Ouachita Ph.)							
	Interstate Nat'l Gas Co.	W. Monroe State Bk. 1 #98	7/12/40	2-3/4 MCF	(Gas)	......	2194
	Interstate Nat'l Gas Co.	W. Monroe State Bk. 1 #99	7/30/40	3-1/2 MCF	"	......	2194
	Interstate Nat'l Gas Co.	Mrs. Clara Cobb 1 #100	8/9/40	3 MCF	"	......	2209
	Interstate Nat'l Gas Co.	L. W. Cobb 1 #101	8/29/40	3-1/2 MCF	"	......	2184
	United Carbon Co.	Munholland #1	9/6/40	1-1/2 MCF	"	......	2189
MONROE (Union Ph.)							
	Memphis Nat'l Gas Co.	Potts #1	7/5/40	1-3/4 MCF	(Gas)	......	2196
	N. & W. Corporation	Holloway #1	7/22/40	2 MCF	"	......	2210
	N. & W. Corporation	Dhu Thompson et al. #1	8/28/40	3/4 MCF	"	......	2115
	N. & W. Corporation	Dhu Thompson et al. #2	9/17/40	3/4 MCF	"	......	2200
	Memphis Nat'l Gas Co.	Lankford #10	9/21/40	3 MCF	"	......	2210
NABORTON (DeSoto Ph.)	W. K. Williams	Wyatt Scott et al. #1	9/22/40	1/2 MCF	(Gas)	......	885
OLLA (LaSalle Ph.)							
	H. L. Hunt	La. Cent. Lbr. #10	4/15/40	194.00	1/4	30.6	3923
	Arkansas Fuel Oil Co.	Goodpine B1	5/29/40	192.00	1"	....	....
	H. L. Hunt	Goodpine #5	5/30/40	450.00	Open	30.6	2429
	H. L. Hunt	Goodpine #4	5/31/40	....	"	30.6	2440
	Arkansas Fuel Oil Co.	Cruse Unit #1	7/10/40	240.00	1/4	....	2246
	H. L. Hunt	Goodpine Lbr. Co. #7	7/14/40	132.00	Open	30.6	2428
	Arkansas Fuel Oil Co.	Goodpine Oil Co. B2	7/21/40	144.00	12/64	30.8	2262
	H. L. Hunt	J. W. Hopkins & La. Cent. 21	7/24/40	240.00	1/4	30.6	2387
	Arkansas Fuel Oil Co.	J. E. Gandy Unit #1	7/29/40	132.00	20/64	31.6	2256
	Arkansas Fuel Oil Co.	Goodpine C-1	8/2/40	168.00	15/64	31.6	2242

Oil and Gas Wells Completed in North Louisiana During 3rd Quarter of 1940

Field	Name of Company	Name of Well	Date Completed	Daily Initial Production	Size Choke (Inch)	Gravity	Total Depth
OLLA (La Salle Ph.)							
	Placid Oil Company	La. Cent. Lbr. Co. #23	8/5/40	212.00	16/64	31.6	2410
	Arkansas Fuel Oil Co.	F. M. Kees # 1	8/14/40	288.39	Open	31.6	2252
	Placid Oil Company	La. Cent. Lbr. #26	8/16/40	199.94	20/64	32.0	2410
	Placid Oil Company	La. Cent. Lbr. #24	8/18/40	306.67	1/4	32.0	2430
	Arkansas Fuel Oil Co.	W. H. Mills #1	8/19/40	168.64	1/4	31.6	2257
	Arkansas Fuel Oil Co.	F. M. Kees B1	8/23/40	168.16	20/64	31.6	2257
	Placid Oil Company	La. Cent. Lbr. #27	8/29/40	150.88	16/64	31.6	2410
	Arkansas Fuel Oil Co.	J. L. Hopkins Unit #1	8/31/40	168.93	20/64	31.7	2236
	H. L. Hunt	La. Cent. Lbr. #15	9/1/40	150.88	20/64	31.0	2411
	Placid Oil Company	La. Cent. Lbr. #29	9/2/40	198.59	16/64	31.6	2421
	Arkansas Fuel Oil Co.	J. E. Harris A1	9/3/40	168.24	12/64	31.6	2230
	Placid Oil Company	La. Cent. #28	9/10/40	115.31	20/64	30.6	2248
	Placid Oil Company	La. Cent. #32	9/10/40	125.67	20/64	30.7	....
	Arkansas Fuel Oil Co.	A. H. Hopkins #1	9/12/40	240.34	20/64	30.7	2215
	Placid Oil Company	La. Cent. #34	9/14/40	135.33	22/64	30.6	2410
	Arkansas Fuel Oil Co.	T. A. Hopkins Unit A1	9/16/40	108.00	20/64	......	2217
	Placid Oil Company	La. Cent. #25	9/17/40	230.64	14/64	31.7	2383
	Placid Oil Company	La. Cent. #43	9/17/40	130.50	12/64	30.7	2383
	Placid Oil Company	La. Cent. #19	9/20/40	200.21	8/32	32.0	2298
	Placid Oil Company	La. Cent. #31	9/20/40	150.09	20/64	31.7	2410
	Arkansas Fuel Oil Co.	G. R. Lizenby A-1	9/26/40	120.58	14/64	32.7	2240
	Placid Oil Company	La. Cent. #33	9/26/40	240.39	14/64	31.6	2445
	Placid Oil Company	La. Cent. #36	9/26/40	300.31	20/64	31.6	2410
	Placid Oil Company	La. Cent. #45	9/26/40	200.93	6/64	31.6	2400
	Placid Oil Company	La. Cent. #46	9/29/40	120.54	8/64	31.0	2700
SHREVEPORT (Caddo Pb.)							
	The Gerhig Co.	La. Conf. CME Ch. #1	8/25/40	162.00	1″	45.0	5626
SLIGO (Bossier Pb.)							
	Triangle Drilling Co.	R. O. Roy A-4	9/8/40	150.00	1/2	42.8	3146
	H. M. Harrell et al.	Mattie Porter Unit #1	9/24/40	1/20 MCF	(Gas)	......	4145
SUGAR CREEK (Claiborne Ph.)							
	Haynes B. Ownby Drlg. Co.	L. E. Ozley Fee #2	9/8/40	363.00	1/4	29.7	5785

*MCF—As used in this table for convenience, means—Million Cubic Feet of Gas.

An "Old Timer" Tells About Hunting In The Good Old Days

[Continued from Page 47]

were used as a covering for the four walls and the roof, and were strung on a framework of tree limbs measuring twelve by twelve feet. The only furniture consisted of two wooden boxes used as chairs and the inevitable shell bucket, which is nothing more than an old time flour bucket, and this came in handy as a third chair. The stove, or heating plant, consisted of a few bricks spread in the center of the room on the ground, upon which was a handful of glowing oak embers and the trusty, rusty coffee pot dripping that Café Noir of swampland fame. One tin cup; two heavy china cups whose handles had long ago been broken; one tin spoon and an iron pot made up the entire kitchen outfit. The bed consisted of a mattress and was in one corner of the room on the floor; the construction of the latter we were unable to learn, not on account of lacking curiosity but, rather, because of our not wanting to seem too inquisitive. It was remarkable that the flying sparks from the now dying embers did not set the dried palmetto overhead aflame, as it seemed that all available sparks took great pleasure racing up to the ceiling whenever the old fire was called upon for quicker results.

While sitting around the fire busy with reveries and happy thoughts of our marvelous hunt, same were rudely broken by the entrance of our host's wife and daughter who displayed, in a very unconcerned manner, nine twelve pound red fish caught only on a hand line tied to the side of their pirogue, and baited with hard shell crab. The first and most natural questions asked by all amateurs were forthcoming, such as, how, where and when and, after listening intently to a very unassuming account of our hostess's piscatorial ability, we learned that they would have caught ever so many more had not her little girl been so cold. No wonder the child was cold since she had on only a thin cotton dress and worn out old sweater, and was without shoes or stockings, while we were just comfortable with two pairs of woolen socks apiece and rubber hip boots on us.

Our coffee being ready at this point, we drank to the health of our host and hostess, and paid the usual charge for a guide's services with an extra bonus thrown in. Then, with a red fish apiece and our many ducks, together with a smile and blessing, and a goodbye in Spanish as well as in French from our Creole friends, we continued our journey campward.

A big full moon had now come up, apparently out of the same lagoon which we had so recently left, and, with its glorious silvery light at our backs, we were soon paddling old Spanish Canal in a dreamy mood, remembering our varied experiences of the day. However, we were soon awakened from our dreams by the rich tenor voice of one of the hunters singing "My Wild Irish Rose" to the swampland and enchanting country known as River Chene, now being left behind but always to remain fresh in our memory.

GAR RODEOS LATEST SPORT

AUSTIN, TEXAS.—The campaign of the State Game Department to get sportsmen fishing for gar is bearing fruit. In fact, it is catching on at such a surprising rate that several cities are now planning gar rodeos, believe it or not!

And gar fishing with a simple noose of No. 30 hair wire is guaranteed to be as sporting a proposition as you will find in Texas waters. Veteran bass fishermen have been known to desert that sport and go in for gar angling almost exclusively. Fishing with light tackle adds to the sport, but any kind of a line and pole, from a flyrod to a bamboo pole, can be used.

The sport is not as simple as it sounds. The first time or two out the fisherman misses about five times as many gar as he catches, but when he gets the knack of jerking the noose closed around the gar's snout then he is really having fun. When you find a concentration of gar it isn't many minutes between bites, whether you catch gar or not.

The Game Department is urging anglers to fish for gar, not only for the thrilling sport that is in it, but because every gar taken out of the water saves many game fish. A request to the Game Department, Austin, will bring a free leaflet detailing how to make the noose and how to fish for gar.

OPEN DATES and BAG and TRAPPING LIMIT

LOUISIANA HUNTING SEASON

1940-1941

RESIDENT GAME BIRDS

BOB WHITE (Quail or Partridge)—December 1 to February 15. 12 Daily, 120 a Season.
WILD TURKEY—Season closed for 5 years.

GAME QUADRUPEDS

DEER—(Bucks Only)—November 15 to January 1. 1 daily, 2 a Season.
(Illegal to kill DOES or FAWNS at any time)
Camp hunting prohibited for more than three days per week.
SQUIRRELS—October 1 to January 15. 10 daily, 120 a Season.
CHIPMUNKS—October 1 to January 15. 10 daily, 120 a Season.
BEARS—November 1 to January 1. 1 a Season.
HARES and RABBITS—October 1 to March 1. No limit—(May Be Sold in Open Season).

MIGRATORY GAME BIRDS

DUCKS—November 2 to December 31, both dates inclusive. Bag Limit 10 daily, Possession Limit 20.
Hunters may have in the aggregate three of any of the following species: Canvasbacks, Redheads, Buffleheads, Ruddy Ducks, or one of all three species in their bag of ten.
COOTS—November 2 to December 31 inclusive. Bag limit 25, Possession limit 25.
GEESE—November 2 to December 31, both dates inclusive. Bag limit 3 in the aggregate of all kinds. Possession limit 6.
SNIPE—November 2 to December 31, both dates inclusive. Bag limit 15. Possession limit 15.
DOVES—December 1 to January 31, both dates inclusive. Bag limit 12. Possession limit 12.
RAILS and GALLINULES—November 1 to January 31, both dates inclusive. Bag limit 15. Possession limit 15.
WOODCOCK—December 15 to December 29, both dates inclusive. Bag limit 4. Possession limit 8.

DUCKS, GEESE AND COOTS MAY BE HUNTED FROM SUNRISE TO 4 P. M. ONLY

SNIPE, RAILS, GALLINULES, WOODCOCK AND MOURNING DOVES MAY BE HUNTED FROM SUNRISE TO SUNSET

USE OF BAIT AND LIVE DECOYS PROHIBITED

NOT MORE THAN TWO DAY'S BAG LIMIT OF DUCKS AND GEESE MAY BE TRANSPORTED IN ONE WEEK

LEGAL LIMIT OF GAME MAY BE POSSESSED 20 DAYS AFTER THE CLOSE OF THE SEASON

HUNTERS OF MIGRATORY WATERFOWL (DUCKS, GEESE, COOTS AND SNIPE) WILL HAVE TO HAVE A STATE HUNTING LICENSE AND A FEDERAL DUCK STAMP

UNLAWFUL TO HUNT IN LOUISIANA WITH A GUN LARGER THAN A 10 GAUGE, OR A GUN CAPABLE OF HOLDING MORE THAN THREE SHELLS

THE COMMISSIONER OF CONSERVATION MAY AT HIS DISCRETION CHANGE DATES OF OPENING AND CLOSING OF SEASON AT ANY TIME

TRAPPING SEASON NOVEMBER 20 TO FEBRUARY 1

RESIDENT TRAPPER'S LICENSE, $2.00 (Only Resident Permitted to Trap)

RESIDENT FUR BUYER'S LICENSE	$ 25
RESIDENT FUR DEALER'S LICENSE	$150
NON-RESIDENT FUR BUYER'S LICENSE	$100
NON-RESIDENT FUR DEALER'S LICENSE	$300

DEPOSIT OF $500.00 TO INSURE PAYMENT OF TAX

DEPARTMENT OF CONSERVATION

B. A. HARDEY, Commissioner

LOUISIANA STATE CAPITOL
BATON ROUGE